

# Complete Test & Exam Archive

[Updated Aug 2024]

This archive contains ALL tests and exams that I have ever created for E&S. I post them here with their complete answers to ensure equal access to previous materials for all students.

**I DO NOT recommend that you solve / study ALL past tests and exams** during your preparation for the test and exam. Studying current practice sets, homework assignments and notes will be a much more productive and efficient use of your time. After you have finished everything else, it is a good idea to cover papers from the last couple of terms to just get a better idea of what to expect.

The papers are in reverse chronological order. Some tasks in older tests and exams may refer to material that is no longer covered in the course or may be specific to discussions that took part in those classes but not in yours.

# Final Exam

Apr. 22, 2024

## Multiple Choice Tasks

Select the answer that most closely answers the question.

1. A professional runner plans to buy a pair of Nike shoes for her next race. Which of the following could be her opportunity cost? [4p]
  - A. The price of the Nike pair of shoes.
  - B. The medical bill in case she twists her ankle during the race.
  - C. That she could have bought a pair of Adidas shoes instead.
  - D. The satisfaction from winning the race.
2. Which of the following is LESS likely to increase the demand for condoms? [4p]
  - A. A decrease in the cost of latex used to make condoms.
  - B. An outbreak of sexually transmitted infections.
  - C. A new law banning abortion.
  - D. An increase in the price of contraceptive pills.
3. Which of the following is the government expected to do, in order to decrease inflation? [4p]
  - A. Decrease investment (I).
  - B. Decrease government spending (G).
  - C. Decrease the income tax coefficient (t).
  - D. Decrease consumption (C).
4. Firms A and B produce homogeneous products, face the same market demand, have identical cost and compete with respect to quantity. Which of the following should B do if he believes that A will produce more than its Cournot quantity? [4p]
  - A. To produce more than A.
  - B. To produce its Cournot quantity.
  - C. To produce less than its Cournot quantity.
  - D. To increase its price.
5. An economy has a nominal GDP growth rate of 3% and inflation 6%. Which is more possible? [4p]
  - A. Real GDP has increased.
  - B. The unemployment rate has decreased.
  - C. The economy has produced less products and services.
  - D. The purchasing power of the citizens has increased.
6. A Singaporean company issued corporate bonds worth S\$10B, which were bought by Singaporean investors. How would this affect Singapore's money market? [4p]
  - A. Money demand has increased.
  - B. Money demand has decreased.
  - C. Money supply has increased.
  - D. Money supply has decreased.
  - E. Money market has not been affected.

7. ChatGPT has made it simple for employees to automate many routine tasks. Which of the following is most likely to be the result of the expected further development of AI? [4p]
- A. Labor productivity will increase.
  - B. Capital productivity will decrease.
  - C. Technological progress will stall.
  - D. Unemployment will decrease.
8. Which of the following is most likely to increase M1? [4p]
- A. When an individual buys a smartphone using a debit card.
  - B. When an individual redeems a winning lottery ticket.
  - C. When the CB buys a government bond by the government.
  - D. When the government raises the salary of all police officers.
  - E. All of the above.
9. Which of the following is more consistent with the statement: "Drunk driving leads to thousands of deadly car accidents every year"? [4p]
- A. The social benefit of drinking alcohol lies below its demand.
  - B. The social benefit of drinking alcohol lies above its demand.
  - C. The social marginal cost of producing alcohol lies below its supply.
  - D. The social marginal cost of producing alcohol lies above its supply.
10. The Central Bank announces that it will increase the interest rate at the end of the year. How would you expect speculators to react? [4p]
- A. They will buy bonds today.
  - B. They will sell bonds today.
  - C. They will sell bonds at the end of the year.
  - D. They will not react to this information.
11. Which of the following is most likely to create a surplus in a PC market? [4p]
- A. A price floor below the PC price.
  - B. A price ceiling below the PC price.
  - C. Both of the above.
  - D. None of the above.
12. Which of the following is more likely to increase employment? [4p]
- A. Stronger labor unions.
  - B. Worse unemployment benefits.
  - C. Illegal immigration from neighboring countries.
  - D. The increase of minimum wage.
13. An economy is currently at its steady-state. Which of the following will happen, if the saving rate ( $s$ ) increases? [4p]
- A. GDP will grow.
  - B. GDP will shrink.
  - C. GDP will remain unchanged.
  - D. All of the above are possible.

## Problem A

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*[Scenario A] The demand for scooters in an economy is given by  $p = 1,000 - 100Q$ , where  $p$  is the price and  $Q$  is the total quantity of scooters. There is only one scooter manufacturer in the economy with a constant marginal cost of 200 and zero fixed cost.*

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14. What price will the monopolist charge in scenario A to maximize her profit? [4p]
- A. Around 0 dollars.
  - B. Around 100 dollars.
  - C. Around 200 dollars.
  - D. Around 300 dollars.
  - E. Around 400 dollars.
  - F. Around 500 dollars.
  - G. Around 600 dollars.
15. How many scooters will the monopolist sell in scenario A, if a regulator forces her to price for efficiency? [4p]
- A. 0 scooters.
  - B. 2 scooters.
  - C. 4 scooters.
  - D. 8 scooters.
  - E. 16 scooters.
  - F. 100 scooters.
16. Which of the following is the most likely to happen in scenario A, if the government forces the monopolist to price for efficiency? [4p]
- A. She will shut down immediately.
  - B. She will continue her operation in the short-run, but she will shut down in the long-run.
  - C. She will continue her operation indefinitely.
  - D. We need more information to answer.

## Problem B

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*[Scenario B] Consider an economy where  $X = M$ , household's consumption is  $C = 150 + 0.5(Y - T)$ , private investment ( $I$ ) is 50, and government spending ( $G$ ) is 100. In this economy the law defines that the Government's budget must be balanced ( $T = G$ ).*

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17. How much is the equilibrium output ( $Y$ ) in the economy from scenario B? [4p]
- A. Around 0.
  - B. Around 100.
  - C. Around 300.
  - D. Around 500.
  - E. Around 700.
  - F. Around 1,000.
  - G. Around 2,000.

18. How much is the tax coefficient ( $t$ ) in the economy from scenario B? [4p]

- A. Zero.
- B. Around 5%.
- C. Around 10%.
- D. Around 15%.
- E. Around 20%.

## Short Answer Tasks

Answer the following questions in no more than 80 words.

19. The Central Bank decides to increase the real interest rate. Briefly explain HOW this will affect the economy.

[7p] *[Limit 80 words]*

20. The Central Bank decides to increase the real interest rate. Briefly explain WHY they may want to do this.

[7p] *[Limit 80 words]*

21. Briefly explain why in macroeconomics money can be considered to actually be debt. [7p] *[Limit 80 words]*

22. When we examined Perfect Competition and Monopolistic Competition in class, we saw that profits in the short-run can be different than in the long-run. When we discussed Monopoly, however, we did NOT distinguish at all between the short-run and the long-run behavior of the firm. Why there is no such distinction in Monopoly? [7p] *[Limit 80 words]*

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END OF TASKS

## Final Exam

Apr. 22, 2024

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. A professional runner plans to buy a pair of Nike shoes for her next race. Which of the following could be her opportunity cost? [4p]
  - A. The price of the Nike pair of shoes.
  - B. The medical bill in case she twists her ankle during the race.
  - C. That she could have bought a pair of Adidas shoes instead.**
  - D. The satisfaction from winning the race.

*[An opportunity cost is a benefit from the alternatives that one loses after committing to one decision]*
2. Which of the following is LESS likely to increase the demand for condoms? [4p]
  - A. A decrease in the cost of latex used to make condoms.** *[The cost of raw materials affects the supply, not the demand]*
  - B. An outbreak of sexually transmitted infections. *[It would incentivize people to protect themselves against STIs]*
  - C. A new law banning abortion. *[People would fear the consequences of unintended pregnancies]*
  - D. An increase in the price of contraceptive pills. *[The price of a substitute affects the demand of the good]*
3. Which of the following is the government expected to do, in order to decrease inflation? [4p]
  - A. Decrease investment ( $I$ ). *[Government does not control private investment, firms do]*
  - B. Decrease government spending ( $G$ ).** *[This would decrease aggregate demand, thus decreasing the price level]*
  - C. Decrease the income tax coefficient ( $t$ ). *[This would have an expansionary effect on expenditure causing more inflation]*
  - D. Decrease consumption ( $C$ ). *[Government does not control consumption, households do]*
4. Firms A and B produce homogeneous products, face the same market demand, have identical cost and compete with respect to quantity. Which of the following should B do if he believes that A will produce more than its Cournot quantity? [4p]
  - A. To produce more than A.
  - B. To produce its Cournot quantity.
  - C. To produce less than its Cournot quantity.**
  - D. To increase its price.

*[In a Cournot reaction function,  $q_1$  and  $q_2$  are inversely related. Thus, if a rival decides to increase their quantity, the optimal reaction for the other rival is to decrease theirs]*

5. An economy has a nominal GDP growth rate of 3% and inflation 6%. Which is more possible? [4p]
- Real GDP has increased. [*real GDP growth rate = nominal GDP growth rate – inflation = 3% – 6% = –3%, thus real GDP has decreased*]
  - The unemployment rate has decreased. [*Since real GDP has decreased, less goods have been produced, which means that less workers were employed*]
  - The economy has produced less products and services.**
  - The purchasing power of the citizens has increased. [*Prices have increased more than the real GDP, so purchasing power has fallen*]
6. A Singaporean company issued corporate bonds worth S\$10B, which were bought by Singaporean investors. How would this affect Singapore's money market? [4p]
- Money demand has increased.
  - Money demand has decreased.
  - Money supply has increased.
  - Money supply has decreased.
  - Money market has not been affected.**  
[*Money just changed hands within Singapore from the investors to the company*]
7. ChatGPT has made it simple for employees to automate many routine tasks. Which of the following is most likely to be the result of the expected further development of AI? [4p]
- Labor productivity will increase.** [*Workers will develop new skills using the AI and will be able to produce more per work hour*]
  - Capital productivity will decrease. [*AI will enable capital to produce more output per machine*]
  - Technological progress will stall. [*AI is supposed to trigger technological development*]
  - Unemployment will decrease. [*AI is expected to replace some jobs and create new ones, however the total impact on employment cannot be predicted*]
8. Which of the following is most likely to increase M1? [4p]
- When an individual buys a smartphone using a debit card.
  - When an individual redeems a winning lottery ticket.
  - When the CB buys a government bond by the government.**
  - When the government raises the salary of all police officers.
  - All of the above.  
[*A, B and D refer only to money changing hands. When CB buys government bonds from the government, fresh money is injected in the economy*]
9. Which of the following is more consistent with the statement: "Drunk driving leads to thousands of deadly car accidents every year"? [4p]
- The social benefit of drinking alcohol lies below its demand.**
  - The social benefit of drinking alcohol lies above its demand.
  - The social marginal cost of producing alcohol lies below its supply.
  - The social marginal cost of producing alcohol lies above its supply.  
[*The statement describes a negative externality of alcohol consumption, which means that the social benefit is lower than the private benefit*]

10. The Central Bank announces that it will increase the interest rate at the end of the year. How would you expect speculators to react? [4p]
- A. They will buy bonds today.
  - B. They will sell bonds today.**
  - C. They will sell bonds at the end of the year.
  - D. They will not react to this information.
- [The increase in interest rate will cause bonds' price to decrease, so speculators will sell them today that their price is still high]*
11. Which of the following is most likely to create a surplus in a PC market? [4p]
- A. A price floor below the PC price. *[Such price floor will be non-binding, thus will not have any effect]*
  - B. A price ceiling below the PC price. *[Binding price ceiling would create a shortage]*
  - C. Both of the above.
  - D. None of the above.**
12. Which of the following is more likely to increase employment? [4p]
- A. Stronger labor unions. *[Labor unions usually negotiate higher wages and employment benefits, which in turn increase unemployment]*
  - B. Worse unemployment benefits.** *[Unemployment benefits may disincentivize some individuals to search for a job]*
  - C. Illegal immigration from neighboring countries. *[Immigrants take low level jobs, thus reducing the number of vacancies for the locals who are interested in such jobs]*
  - D. The increase of minimum wage. *[Firms which cannot afford the higher minimum wage will reduce their personnel]*
13. An economy is currently at its steady-state. Which of the following will happen, if the saving rate ( $s$ ) increases? [4p]
- A. GDP will grow.**
  - B. GDP will shrink.
  - C. GDP will remain unchanged.
  - D. All of the above are possible.
- [Increase in  $s$  will cause  $sY > dK$ , which will lead to GDP growth]*

## Problem A

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*[Scenario A] The demand for scooters in an economy is given by  $p = 1,000 - 100Q$ , where  $p$  is the price and  $Q$  is the total quantity of scooters. There is only one scooter manufacturer in the economy with a constant marginal cost of 200 and zero fixed cost.*

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14. What price will the monopolist charge in scenario A to maximize her profit? [4p]
- A. Around 0 dollars.
  - B. Around 100 dollars.
  - C. Around 200 dollars.
  - D. Around 300 dollars.
  - E. Around 400 dollars.
  - F. Around 500 dollars.
  - G. Around 600 dollars.**



*[MR = MC or  $1,000 - 200Q = 200$  or  $200Q = 800$  or  $Q = 4$ . Then, from the demand function  $p = 1,000 - 100 \cdot 4$  or  $p = 600$ ]*

15. How many scooters will the monopolist sell in scenario A, if a regulator forces her to price for efficiency? [4p]

- A. 0 scooters.
- B. 2 scooters.
- C. 4 scooters.
- D. 8 scooters.**
- E. 16 scooters.
- F. 100 scooters.

*[Monopolist now is forced to price at  $p = MC$  or  $p = 200$ . Then, again from the demand function we have  $200 = 1,000 - 100Q$  or  $100Q = 800$  or  $Q = 8$ ]*

16. Which of the following is the most likely to happen in scenario A, if the government forces the monopolist to price for efficiency? [4p]

- A. She will shut down immediately.
- B. She will continue her operation in the short-run, but she will shut down in the long-run.
- C. She will continue her operation indefinitely.**
- D. We need more information to answer.

*[Constant MC and zero FC mean that  $AC = MC = 200$ . Profit for the seller is  $\Pi = (p - AC)Q = (200 - 200)8 = 0$ . With  $\Pi = 0$  the monopolist has no reason to ever shut down]*

## Problem B

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*[Scenario B] Consider an economy where  $X = M$ , household's consumption is  $C = 150 + 0.5(Y - T)$ , private investment ( $I$ ) is 50, and government spending ( $G$ ) is 100. In this economy the law defines that the Government's budget must be balanced ( $T = G$ ).*

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17. How much is the equilibrium output ( $Y$ ) in the economy from scenario B? [4p]

- A. Around 0.
- B. Around 100.
- C. Around 300.
- D. Around 500.**
- E. Around 700.
- F. Around 1,000.
- G. Around 2,000.

*[ $Y = C + I + G$  or  $Y = 150 + 0.5(Y - T) + 50 + 100$  or because  $T = G$ ,  $Y = 300 + 0.5(Y - 100)$  or  $Y = 300 + 0.5Y - 50$  or  $0.5Y = 250$  or  $Y = 500$ ]*

18. How much is the tax coefficient ( $t$ ) in the economy from scenario B? [4p]

- A. Zero.
- B. Around 5%.
- C. Around 10%.
- D. Around 15%.
- E. Around 20%.**

*[Collected taxes are  $T = G = 100$ . Income is  $Y = 500$ . Thus. taxation ( $t$ ) is the 20% of income]*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

19. The Central Bank decides to increase the real interest rate. Briefly explain HOW this will affect the economy. [7p] *[Limit 80 words]*

*A higher real interest rate will render several investment projects in the economy not worthy, thus they will never materialize. As a result, employment and real GDP will decrease. [29 words]*

20. The Central Bank decides to increase the real interest rate. Briefly explain WHY they may want to do this. [7p] *[Limit 80 words]*

*A higher interest rate will discourage loans and the M1 money circulating in the economy will decrease. This will prevent prices from further increasing and curb inflation. [27 words]*

21. Briefly explain why in macroeconomics money can be considered to actually be debt. [7p] *[Limit 80 words]*

*When a transaction occurs, the seller receives money in exchange for the good or the service sold. This money can be seen as an "IOU" or an unsettled transaction because the economy has not yet paid back the seller with a real good or service of equal value. [48 words]*

22. When we examined Perfect Competition and Monopolistic Competition in class, we saw that profits in the short-run can be different than in the long-run. When we discussed Monopoly, however, we did NOT distinguish at all between the short-run and the long-run behavior of the firm. Why there is no such distinction in Monopoly? [7p] *[Limit 80 words]*

*Monopoly has barriers of entry. Even when the seller has high profits, entry will not occur, thus, S-R profits can be maintained in the L-R. [25 words]*

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END OF TASKS

## Midterm Test

Feb. 23, 2024

### Multiple Choice Tasks

Select the answer that most closely answers the question.

- Which of the following is implied by the post hoc propter ergo hoc fallacy? [4p]
  - That correlation does not imply causation.
  - That it is possible to approximate a system by replacing all actors with the average actor.
  - That not all costs are explicit.
  - None of the above.
- Which of the following will increase the demand for electricity? [4p]
  - A decrease in the price of electricity.
  - An increase in the sales of electric vehicles.
  - Both of the above.
  - None of the above.
- Which of the following is implied by the statement: "My marginal utility for the 5th slice of pizza was -4"? [4p]
  - I dislike pizza.
  - I enjoyed my 5th slice but less than my 4th.
  - The 5th slice decreased my total utility from eating pizza.
  - The statement has no implication at all.
- Which of the following cannot be decreasing as more quantity is produced? [4p]
  - Marginal cost.
  - Average cost.
  - Total cost.
  - Opportunity cost.
- Which of the following markets is more likely to be perfectly competitive? [4p]
  - The market of hair salons.
  - The market of patented medications for sarcoidosis.
  - The market of high-performance sports cars.
  - The market of Apple shares at the New York Stock Exchange.
- A market starts from perfect competition and after a series of mergers, acquisitions and exits, ends up becoming a monopoly. Which of the following is/are true? [4p]
  - A DWL has emerged.
  - Total profit in the industry is now higher.
  - Total production in the industry is now lower.
  - All of the above.

7. The perfectly competitive quantity in an industry is 100 units. Which of the following would be the case if a 101th unit was sold? [4p]
- A. The gains from trade from the 101th unit would be negative.
  - B. The demand for the product would increase.
  - C. The marginal revenue would increase.
  - D. All of the above.
8. Which of the following is true in a kinked-demand industry? [4p]
- A. Other rivals may overreact if someone drops the price.
  - B. Other rivals will not care if someone increases the price.
  - C. Rivals have somehow agreed to follow some prevailing price.
  - D. All of the above.
9. Which of the following contribute(s) to collusion being unsustainable in a Cournot oligopoly? [4p]
- A. A collusive agreement cannot be legally enforced.
  - B. A collusive agreement creates an incentive for cheating.
  - C. Profit for a firm that is cheated upon is lower than its Cournot profit.
  - D. All of the above.
10. Which of the following is more likely to be a public good? [4p]
- A. Transportation services.
  - B. Health services.
  - C. Education services.
  - D. Police services.
11. Which of the following is illegal? [4p]
- A. Charging prices above the monopoly price.
  - B. Charging below your AC to drive rivals out of the market.
  - C. Charging identical price with your other rivals.
  - D. All of the above.
12. Which of the following is more likely to be a market failure? [4p]
- A. A market where firms produce a heterogeneous good, and thus all firms have market power.
  - B. A country where marihuana, sex work and alcohol are legal.
  - C. A country where the price of the average home is unaffordable for the average family.
  - D. A market where prices fluctuate on a daily basis.
13. Which of the following is a positive externality? [4p]
- A. Second-hand smoking.
  - B. The life-long benefits you will receive from your education.
  - C. The utility you receive from attending a concert of your favorite artist.
  - D. None of the above.

## Problem A

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*[Scenario A] Any firm can enter a market with  $FC = 3,000$ . Production assumes  $AVC = MC = 20$ . Demand is  $p = 200 - 2Q$ , where  $p$  is the price and  $Q$  is the total quantity produced.*

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14. In scenario A: What will be the profit, if only one firm enters the market? [4p]
- A. Around -1,200.
  - B. Around -1,000.
  - C. Around -750.
  - D. Around -500.
  - E. Zero.
  - F. Around 500.
  - G. Around 750.
  - H. Around 1,000.
  - I. Around 1,200.
15. In scenario A: What will be the profit per firm, if two firms enter the market and compete with respect to quantity? [4p]
- A. Around -1,200.
  - B. Around -1,000.
  - C. Around -750.
  - D. Around -500.
  - E. Zero.
  - F. Around 500.
  - G. Around 750.
  - H. Around 1,000.
  - I. Around 1,200.
16. To which of the following structures the market in scenario A would most likely end up? [4p]
- A. Perfect Competition.
  - B. Cournot Oligopoly.
  - C. Monopoly.
  - D. Natural Monopoly.
  - E. Kinked-demand Oligopoly.

## Problem B

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*[Scenario B] Dasha's quantity demanded for taxi rides per month at different prices is given in the table.*

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Price	Taxi rides
\$30	1
\$25	2
\$20	3
\$15	4
\$10	5
\$5	6

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17.

18. In scenario B, what is Dasha's consumer surplus if the price per ride is \$15? [4p]
- A. Zero.
  - B. Around \$5.
  - C. Around \$10.
  - D. Around \$15.
  - E. Around \$20.
  - F. Around \$25.
  - G. Around \$30.
19. In scenario B, the taxi driver's MC for a ride is \$10 and the price per ride is \$15. How much are the total gains from trade? [4p]
- A. Zero.
  - B. Around \$10.
  - C. Around \$20.
  - D. Around \$30.
  - E. Around \$40.
  - F. Around \$50.
  - G. Around \$60.

## Short Answer Tasks

Answer the following questions in no more than 80 words.

20. Gym memberships for average gyms in Singapore typically cost around \$100 per month. A very small gym on Serangoon Rd. with minimal equipment and not recently renovated charges \$150 per month. Why does this make economic sense? [7p] *[Limit 80 words]*
21. A company produces makeup tubes. Production cost is \$5 per tube and retail price is \$15 per tube. The company will not be able to sell any units without promotion. A TikTok influencer can promote the product to her audience by posting a video that costs her \$250 to produce and drive sales of 100,000 tubes. How much will the influencer charge the company for posting the video and what does her price depend on? [7p] *[Limit 80 words]*

22. In September 2023, Singapore's Ministry of Transport subsidized the MRT with "Additional \$300M Government Support to Moderate Fare Increase". MRT is a monopoly. Why does the Government have to subsidize it? [7p] *[Limit 80 words]*

23. Explain how product ecosystems can create barriers to entry. [7p] *[Limit 80 words]*

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END OF TASKS

## Midterm Test KEY

Feb. 23, 2024

### Multiple Choice Tasks

Select the answer that most closely answers the question.

- Which of the following is implied by the post hoc propter ergo hoc fallacy? [4p]
  - That correlation does not imply causation.**
  - That it is possible to approximate a system by replacing all actors with the average actor. *[This is implied by the concept of representative agent]*
  - That not all costs are explicit. *[This is implied by the concept of opportunity cost]*
  - None of the above.  
*[Post hoc propter ergo hoc fallacy implies that when an event consistently precedes another event, it doesn't necessarily mean that the former caused the latter]*
- Which of the following will increase the demand for electricity? [4p]
  - A decrease in the price of electricity. *[This would increase the quantity demanded for electricity]*
  - An increase in the sales of electric vehicles.** *[True since electricity and electric vehicles are complements]*
  - Both of the above.
  - None of the above.
- Which of the following is implied by the statement: "My marginal utility for the 5th slice of pizza was -4"? [4p]
  - I dislike pizza. *[This is impossible!]*
  - I enjoyed my 5th slice but less than my 4th. *[Negative marginal utility means that I did not enjoy the 5<sup>th</sup> slice]*
  - The 5th slice decreased my total utility from eating pizza.** *[Negative marginal utility means that I had a loss in terms of total utility, when I consumed the 5<sup>th</sup> slice]*
  - The statement has no implication at all.
- Which of the following cannot be decreasing as more quantity is produced? [4p]
  - Marginal cost. *[An additional unit may cost less than its previous unit's cost]*
  - Average cost. *[An additional unit may cost less on average than what its previous unit cost]*
  - Total cost.** *[Since more resources are required to produce extra units, total cost will also increase]*
  - Opportunity cost. *[Has nothing to do with production cost]*
- Which of the following markets is more likely to be perfectly competitive? [4p]
  - The market of hair salons. *[Services provided in this market are usually heterogeneous]*
  - The market of patented medications for sarcoidosis. *[Patents limit competition in a market]*
  - The market of high-performance sports cars. *[Products in this market are mostly heterogeneous]*
  - The market of Apple shares at the New York Stock Exchange.** *[Apple shares are homogeneous, while many buyers and sellers participate in a market with no barriers of entry]*



6. A market starts from perfect competition and after a series of mergers, acquisitions and exits, ends up becoming a monopoly. Which of the following is/are true? [4p]
- A DWL has emerged.
  - Total profit in the industry is now higher.
  - Total production in the industry is now lower.
  - All of the above.**
- [In a PC market DWL and profit are zero, and the largest possible quantity is also produced. If it becomes a monopoly the price will increase, quantity produced will decrease, while DWL and profit will also increase]*
7. The perfectly competitive quantity in an industry is 100 units. Which of the following would be the case if a 101th unit was sold? [4p]
- The gains from trade from the 101th unit would be negative.** *[At the PC equilibrium quantity all gains of trade are captured; therefore, there will be a relative loss if an extra unit is sold]*
  - The demand for the product would increase. *[Nothing mentioned would cause a demand shift]*
  - The marginal revenue would increase. *[MR curve's negative slope implies that MR decreases with each additional unit]*
  - All of the above.
8. Which of the following is true in a kinked-demand industry? [4p]
- Other rivals may overreact if someone drops the price. *[Competitors may see it as a price war]*
  - Other rivals will not care if someone increases the price. *[Competitors are not threatened by price increases]*
  - Rivals have somehow agreed to follow some prevailing price. *[Competitors follow the same pricing pattern implicitly or explicitly]*
  - All of the above.**
9. Which of the following contribute(s) to collusion being unsustainable in a Cournot oligopoly? [4p]
- A collusive agreement cannot be legally enforced. *[Firms indeed cannot rely on legal mechanisms to enforce their agreements]*
  - A collusive agreement creates an incentive for cheating. *[Each firm has an incentive to deviate and increase its output to capture a larger share of the market and obtain higher profits]*
  - Profit for a firm that is cheated upon is lower than its Cournot profit. *[If one firm cheats and increase its output, price will fall and the other firm, which adhered to the collusive quantity, will see its profits decrease]*
  - All of the above.**
10. Which of the following is more likely to be a public good? [4p]
- Transportation services. *[You must pay for the ticket]*
  - Health services. *[Hospitals may charge you a fee to provide you with their services]*
  - Education services. *[You can exclude someone from education if you charge tuition fees]*
  - Police services.** *[You cannot exclude someone who does not pay; also, the use of police services from a citizen does not preclude their use from another]*
11. Which of the following is illegal? [4p]
- Charging prices above the monopoly price. *[This is foolish, not illegal]*
  - Charging below your AC to drive rivals out of the market.** *[Predatory pricing is illegal in advanced economies, because it distorts competition]*
  - Charging identical price with your other rivals. *[This happens to many competitive markets]*

D. All of the above.

12. Which of the following is more likely to be a market failure? [4p]

- A. A market where firms produce a heterogeneous good, and thus all firms have market power. *[Since market power arises from product heterogeneity, it is not a market failure]*
- B. A country where marijuana, sex work and alcohol are legal. *[Legalizing certain goods and services does not inherently lead to market failure]*
- C. **A country where the price of the average home is unaffordable for the average family.** *[It means that the housing market fails to allocate the good to those who value it the most]*
- D. A market where prices fluctuate on a daily basis. *[If prices fluctuate but equilibrate the demand and the supply, this is not a market failure too]*

13. Which of the following is a positive externality? [4p]

- A. Second-hand smoking. *[This is a negative externality]*
- B. The life-long benefits you will receive from your education. *[This is not an externality, since you study for your own benefit]*
- C. The utility you receive from attending a concert of your favorite artist. *[This is not an externality; you pay for the utility you get]*
- D. **None of the above.**

## Problem A

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**[Scenario A]** Any firm can enter a market with  $FC = 3,000$ . Production assumes  $AVC = MC = 20$ . Demand is  $p = 200 - 2Q$ , where  $p$  is the price and  $Q$  is the total quantity produced.

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14. In scenario A: What will be the profit, if only one firm enters the market? [4p]

- A. Around -1,200.
- B. Around -1,000.
- C. Around -750.
- D. Around -500.
- E. Zero.
- F. Around 500.
- G. Around 750.
- H. **Around 1,000.**
- I. Around 1,200.

*[For the monopoly  $MR = MC$  or  $200 - 4Q = 20$  or  $Q = 45$ . Then,  $p = 200 - 2 \cdot 45$ , or  $p = 110$ . Then,  $\Pi = (p - c)q - FC = (110 - 20)45 - 3,000$  or  $\Pi = 1,050$ ]*

15. In scenario A: What will be the profit per firm, if two firms enter the market and compete with respect to quantity? [4p]

- A. **Around -1,200.**
- B. Around -1,000.
- C. Around -750.
- D. Around -500.
- E. Zero.
- F. Around 500.
- G. Around 750.
- H. Around 1,000.

- I. Around 1,200.

*[For the Cournot firm 1:  $MR_1 = MC$  or  $200 - 4q_1 - 2q_2 = 20$ . Since at equilibrium  $q_1 = q_2$ ,  $200 - 4q_1 - 2q_1 = 20$  or  $q_1 = 30$ . Then,  $p = 200 - 2(30 + 30)$ , or  $p = 80$ . Then,  $\Pi_1 = (p - c)q - FC = (80 - 20)30 - 3,000$  or  $\Pi_1 = -1,200$ ]*

16. To which of the following structures the market in scenario A would most likely end up? [4p]

- A. Perfect Competition. *[If Cournot yields losses, PC would also yield more losses. No firms will enter if there is already an incumbent].*
- B. Cournot Oligopoly. *[Losses would lead to the exit of one firm]*
- C. Monopoly. *[There are no barriers to entry]*
- D. **Natural Monopoly.** *[Only one firm can survive in the L-R. Entry of more than one firms will bring losses for everyone]*
- E. Kinked-demand Oligopoly. *[No evidence of price-cut overreaction by rivals]*

## Problem B

*[Scenario B] Dasha's quantity demanded for taxi rides per month at different prices is given in the table.*

Price	Taxi rides
\$30	1
\$25	2
\$20	3
\$15	4
\$10	5
\$5	6

17. In scenario B, what is Dasha's consumer surplus if the price per ride is \$15? [4p]

- A. Zero.
- B. Around \$5.
- C. Around \$10.
- D. Around \$15.
- E. Around \$20.
- F. Around \$25.
- G. **Around \$30.**

*[For the first ride, she is willing to pay \$30 and pays \$15; she receives surplus of \$15.*

*For the second ride, she is willing to pay \$25 and pays \$15; she receives surplus of \$10.*

*For the third ride, she is willing to pay \$20 and pays \$15; she receives surplus of \$5.*

*For the fourth ride, she is willing to pay \$15 and pays \$15; she receives no surplus.*

*Her total surplus is \$30]*

18. In scenario B, the taxi driver's MC for a ride is \$10 and the price per ride is \$15. How much are the total gains from trade? [4p]

- A. Zero.
- B. Around \$10.
- C. Around \$20.
- D. Around \$30.
- E. Around \$40.
- F. **Around \$50.**
- G. Around \$60.

*[Dasha values her first ride at \$30 and the driver values it at \$10, there is a gain from trade \$20.  
Dasha values her second ride at \$25 and the driver values it at \$10, there is a gain from trade \$15.  
Dasha values her third ride at \$20 and the driver values it at \$10, there is a gain from trade \$10.  
Dasha values her fourth ride at \$15 and the driver values it at \$10, there is a gain from trade \$5.  
Total gains from trade are \$50]*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

19. Gym memberships for average gyms in Singapore typically cost around \$100 per month. A very small gym on Serangoon Rd. with minimal equipment and not recently renovated charges \$150 per month. Why does this make economic sense? [7p] *[Limit 80 words]*

*It is because of the law of demand. A small gym can accommodate only a few clients, which means that the quantity is small, thus the price can be high. [30 words]*

20. A company produces makeup tubes. Production cost is \$5 per tube and retail price is \$15 per tube. The company will not be able to sell any units without promotion. A TikTok influencer can promote the product to her audience by posting a video that costs her \$250 to produce and drive sales of 100,000 tubes. How much will the influencer charge the company for posting the video and what does her price depend on? [7p] *[Limit 80 words]*

*If the influencer is one of plenty influencers who have access to this audience, her compensation will be slightly above \$250. If she has no other competitors, her price can be closer to  $(15-5)100,000 = \$1m$ , which is the potential gain from collaboration. [43 words]*

21. In September 2023, Singapore's Ministry of Transport subsidized the MRT with "Additional \$300M Government Support to Moderate Fare Increase". MRT is a monopoly. Why does the Government have to subsidize it? [7p] *[Limit 80 words]*

*The MRT is regulated to  $p = MC$  for maximum efficiency. This maximizes the public's access to the service, keeps fares affordable for the users, but also creates losses which have to be covered by taxpayers for the MRT to keep operating. [40 words]*

22. Explain how product ecosystems can create barriers to entry. [7p] *[Limit 80 words]*

*Products purposely designed to be compatible only with other products by the same manufacturer lock the consumers in. It becomes harder for new manufacturers to enter the market once most consumers have already committed to some existing company's ecosystem. [39 words]*

END OF TASKS

## Final Exam

Nov. 27, 2023

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. Which of the following is NOT a good application of the "representative agent" assumption? [4p]
  - A. Modeling the behavior of 8 firms in a monopolistically competitive market.
  - B. Modeling the behavior of 80 firms in a perfectly competitive market.
  - C. Modeling the behavior of a master's class where 30 students have engineering background and another 25 have law background.
  - D. Modeling the wages paid by an accounting firm to its 72 male and 45 female employees.
2. Which of the following is likely to increase the demand for petrol? [4p]
  - A. An increase in the sales of electric cars.
  - B. An increase in the sales of petrol-powered cars.
  - C. An increase in the quantity of oil Saudi Arabia puts for sale.
  - D. All of the above.
  - E. None of the above.
3. Which of the following markets is more likely to be monopolistically competitive? [4p]
  - A. Manufacturing of cement.
  - B. Hair salons along Orchard Str.
  - C. Major erectile dysfunction medications.
  - D. The MRT.
4. Which of the following is the CB expected to do if the government decides to spend an extra 100 million dollars purchasing new locally made MRI machines for all public hospitals and bank reserves are scarce? [4p]
  - A. Nothing at all.
  - B. Buy government securities in the open market.
  - C. Print 100 million dollars' worth of new banknotes.
  - D. Increase the interest rate.
5. Which of the following is M1 money? [4p]
  - A. A money market deposit at a local bank.
  - B. A \$100 deposit by a local commercial bank to the CB.
  - C. A \$50 bill that was burned in a house fire.
  - D. All of the above.
  - E. None of the above.

6. I buy a pair of headphones paying \$100 to the vendor with my OCBC debit card. The vendor receives the \$100 in his DBS account and immediately uses it to pay a supplier by transferring the \$100 to the supplier's UOB account. Which of the following is likely to happen? [Hint: all 3 acronyms are names of different commercial banks located in Singapore] [4p]
- A. 100 dollars of physical money will be transferred from OCBC to DBS and then to UOB.
  - B. 100 dollars of physical money will be transferred from OCBC to UOB because the CB will simplify the transactions.
  - C. The CB will clear all payments because they are circular and cancel out.
7. In 2022, GDP in Greece increased by 5.9% but the average wage decreased by 7.4%. How was this possible? [4p]
- A. It is not possible for both things to happen in the same year.
  - B. Taxation increased substantially.
  - C. Income inequality increased.
  - D. Unemployment increased.
8. Priya loans \$1,000 to Nate at an interest rate of 4% for one year. Which of the following played a role in the determination of the rate to 4%? [4p]
- A. Anticipated inflation.
  - B. The opportunity cost of inconvenience for Priya that now she cannot use her \$1,000 for something else.
  - C. The risk that Nate may not be in a position to pay back the loan.
  - D. All of the above.
9. Why is it important for the CB to control the interest rate? [4p]
- A. Because the interest rate affects money demand.
  - B. Because the interest rate affects money supply.
  - C. Because the interest rate affects investment.
  - D. Because the interest rate affects government spending.
10. Current GDP is 100 and steady-state GDP is 80. Which of the following is most likely to happen next year? [4p]
- A. GDP will grow.
  - B. GDP will stay stagnant.
  - C. GDP will shrink.
  - D. There is not enough information to tell what the GDP will do.
11. An economy is currently near its steady-state. Which of the following is true? [4p]
- A. The economy will not grow significantly if it builds more capital.
  - B. The economy will grow significantly if there is substantial technological progress.
  - C. The economy will grow significantly if there is substantial infusion of high skilled foreign talent.
  - D. All of the above.
12. Which of the following is a market failure due to negative externality? [4p]
- A. Covid-19.
  - B. Collusion.
  - C. Inflation.
  - D. Air pollution.

13. Which of the following could be an opportunity cost for Peter regarding his decision to marry Lois? [4p]
- A. Without Lois he would never have his daughter Meg and his sons Chris and Stewie.
  - B. The cost of the wedding.
  - C. The fact that he has to work at a brewery to feed his family.
  - D. That he could have married his ex-girlfriend Gretchen Mercer instead of Lois.

## Problem A

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*[Scenario A] Yanni operates an olive grove in Greece and sells 2,000 euros worth of raw olives to AB Supermarkets in Greece. AB supermarkets retailed the olives for 4,000 euros to consumers. Yanni also sells 10,000 euros worth of olives to George who operates an oil press, also in Greece. George sells 18,000 euros worth of extra virgin olive oil to ItaOils, a corporation in Italy that packages oil products. ItaOils exports 30,000 euros worth of bottled extra virgin olive oil to Mustafa center in Singapore, who sold it for the equivalent of 35,000 euros to its customers. ItaOils also exports 10,000 euros worth of bottled extra virgin olive oil to AB Supermarkets in Greece, who retailed it for 18,000 euros.*

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14. The activities described in Scenario A have increased Singapore's GDP by how much (in euros)? [4p]
- A. 0 euros.
  - B. 5,000 euros.
  - C. 8,000 euros.
  - D. 10,000 euros.
  - E. 12,000 euros.
  - F. 18,000 euros.
  - G. 20,000 euros.
  - H. 22,000 euros.
  - I. 30,000 euros.
  - J. 35,000 euros.
  - K. 57,000 euros.
15. The activities described in Scenario A have increased Italy's GDP by how much? [4p]
- A. 0 euros.
  - B. 5,000 euros.
  - C. 8,000 euros.
  - D. 10,000 euros.
  - E. 12,000 euros.
  - F. 18,000 euros.
  - G. 20,000 euros.
  - H. 22,000 euros.
  - I. 30,000 euros.
  - J. 35,000 euros.
  - K. 57,000 euros.

16. The activities described in Scenario A have increased Greece's GDP by how much? [4p]

- A. 0 euros.
- B. 5,000 euros.
- C. 8,000 euros.
- D. 10,000 euros.
- E. 12,000 euros.
- F. 18,000 euros.
- G. 20,000 euros.
- H. 22,000 euros.
- I. 30,000 euros.
- J. 35,000 euros.
- K. 57,000 euros.

## Problem B

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*[Scenario B] The demand for bicycles in a town is given by  $p = 550 - 3Q$ , where  $p$  is the price and  $Q$  is the total quantity of bicycles available for sale. The marginal cost for making a bicycle is constant and equal to 10. Two identical manufacturers of bicycles already exist in this town and compete with respect to quantity.*

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17. What will the profit maximizing price be in scenario B? [4p]

- A. Around 0 dollars.
- B. Around 50 dollars.
- C. Around 100 dollars.
- D. Around 130 dollars.
- E. Around 170 dollars.
- F. Around 190 dollars.
- G. Around 210 dollars.

18. What will the profit maximizing price be for the two incumbent manufacturers in scenario B, if a third manufacturer enters the market and makes available for sale exactly 60 bicycles not caring for how the two incumbent manufacturers will react? [4p]

- A. Around 0 dollars.
- B. Around 50 dollars.
- C. Around 100 dollars.
- D. Around 130 dollars.
- E. Around 170 dollars.
- F. Around 190 dollars.
- G. Around 210 dollars.



## Short Answer Tasks

Answer the following questions in no more than 80 words.

19. Present a brief example of someone who has the comparative but not the absolute advantage in something. [7p] *[Limit 80 words]*

20. Briefly explain the difference(s) between structural and frictional unemployment. [7p] *[Limit 80 words]*

21. The CB has committed to a specific interest rate and banks have ample reserves. Then, money demand unexpectedly increases. Briefly explain what will happen to the money market. [7p] *[Limit 80 words]*

22. When you use a debit card for any purchase, the bank withholds 2% commission from the merchant. Based on this fact, a viral TikTok claims the following: "For a \$50 debit transaction, the bank keeps \$1 and the merchant receives only \$49. If the merchant also uses debit to spend the \$49, the next merchant will receive only \$48.02. If all next recipients of the money use debit for their transactions, the amount will keep falling to \$47.06, then 46.12, then \$45.2 etc. and after around 200 debit transactions the amount will have shrunk to less than \$1! This means that banks gradually collected \$49 out of the initial \$50 and only \$1 remained in the real economy!" Explain if this claim is true or false. [7p] *[Limit 80 words]*

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END OF TASKS

## Final Exam

Nov. 27, 2023

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. Which of the following is NOT a good application of the "representative agent" assumption? [4p]
  - A. Modeling the behavior of 8 firms in a monopolistically competitive market.
  - B. Modeling the behavior of 80 firms in a perfectly competitive market.
  - C. Modeling the behavior of a master's class where 30 students have engineering background and another 25 have law background.**
  - D. Modeling the wages paid by an accounting firm to its 72 male and 45 female employees.  
*[We should not use the representative agent when the population consists of widely different groups. Lawyers and engineers have more different educational backgrounds than the difference in wages between male and female accountants]*
2. Which of the following is likely to increase the demand for petrol? [4p]
  - A. An increase in the sales of electric cars. *[Should decrease the demand for petrol]*
  - B. An increase in the sales of petrol-powered cars. *[Should increase the demand for petrol]***
  - C. An increase in the quantity of oil Saudi Arabia puts for sale. *[Should affect the quantity demanded of petrol and not its demand]*
  - D. All of the above.
  - E. None of the above.
3. Which of the following markets is more likely to be monopolistically competitive? [4p]
  - A. Manufacturing of cement. *[Cement is homogeneous]*
  - B. Hair salons along Orchard Str.**
  - C. Major erectile dysfunction medications. *[A classic example of oligopoly]*
  - D. The MRT. *[An example of natural monopoly]*
4. Which of the following is the CB expected to do if the government decides to spend an extra 100 million dollars purchasing new locally made MRI machines for all public hospitals and bank reserves are scarce? [4p]
  - A. Nothing at all.
  - B. Buy government securities in the open market.**
  - C. Print 100 million dollars' worth of new banknotes.
  - D. Increase the interest rate.  
*[We have an increase in G that has to be accommodated by an increase in money supply by the CB to prevent the interest rate from changing]*

5. Which of the following is M1 money? [4p]
- A money market deposit at a local bank. *[Not liquid enough to be M1]*
  - A \$100 deposit by a local commercial bank to the CB. *[Reserves are not money]*
  - A \$50 bill that was burned in a house fire. *[A burned banknote does not have purchasing power]*
  - All of the above.
  - None of the above.**
6. I buy a pair of headphones paying \$100 to the vendor with my OCBC debit card. The vendor receives the \$100 in his DBS account and immediately uses it to pay a supplier by transferring the \$100 to the supplier's UOB account. Which of the following is likely to happen? [Hint: all 3 acronyms are names of different commercial banks located in Singapore] [4p]
- 100 dollars of physical money will be transferred from OCBC to DBS and then to UOB.
  - 100 dollars of physical money will be transferred from OCBC to UOB because the CB will simplify the transactions.**
  - The CB will clear all payments because they are circular and cancel out.  
*[The flows of money here are not circular. The only entity that both owes and is owed \$100 is DBS, so only its interbank transactions will be cleared by the CB]*
7. In 2022, GDP in Greece increased by 5.9% but the average wage decreased by 7.4%. How was this possible? [4p]
- It is not possible for both things to happen in the same year.
  - Taxation increased substantially. *[Increase in taxation is not expected to bring GDP growth]*
  - Income inequality increased.** *[The extra income was claimed by only a few while others lost income]*
  - Unemployment increased. *[Increase in unemployment is not expected to bring GDP growth]*
8. Priya loans \$1,000 to Nate at an interest rate of 4% for one year. Which of the following played a role in the determination of the rate to 4%? [4p]
- Anticipated inflation.
  - The opportunity cost of inconvenience for Priya that now she cannot use her \$1,000 for something else.
  - The risk that Nate may not be in a position to pay back the loan.
  - All of the above.** *[All of the above are costs in a loan that have to be compensated]*
9. Why is it important for the CB to control the interest rate? [4p]
- Because the interest rate affects money demand. *[r affects the quantity of money demanded]*
  - Because the interest rate affects money supply. *[r does not affect money supply]*
  - Because the interest rate affects investment.**
  - Because the interest rate affects government spending. *[It does not]*
10. Current GDP is 100 and steady-state GDP is 80. Which of the following is most likely to happen next year? [4p]
- GDP will grow.
  - GDP will stay stagnant.
  - GDP will shrink.** *[When actual GDP is above the steady-state GDP,  $sY < dk$ , thus capital next year will be less and the economy will shrink]*
  - There is not enough information to tell what the GDP will do.

11. An economy is currently near its steady-state. Which of the following is true? [4p]
- A. The economy will not grow significantly if it builds more capital. *[As the economy is near its steady-state capital, more capital will make  $sY < dk$  and the economy cannot grow significantly]*
  - B. The economy will grow significantly if there is substantial technological progress. *[Correct, because this will make  $Y$  to shift upwards]*
  - C. The economy will grow significantly if there is substantial infusion of high skilled foreign talent. *[Correct, because this will make  $Y$  to shift upwards]*
  - D. All of the above.**
12. Which of the following is a market failure due to negative externality? [4p]
- A. Covid-19.
  - B. Collusion.
  - C. Inflation.
  - D. Air pollution.**
- [A negative externality is when a beneficial transaction between two parties has a negative result on a third party who did not take part in the transaction. A, B, and C are not the results of some transaction]*
13. Which of the following could be an opportunity cost for Peter regarding his decision to marry Lois? [4p]
- A. Without Lois he would never have his daughter Meg and his sons Chris and Stewie.
  - B. The cost of the wedding.
  - C. The fact that he has to work at a brewery to feed his family.
  - D. That he could have married his ex-girlfriend Gretchen Mercer instead of Lois.**
- [An opportunity cost is a benefit that you lose when you commit to one decision. A, B and C are not benefits lost because of Peter's decision to marry Lois]*

## Problem A

---

**[Scenario A]** Yanni operates an olive grove in Greece and sells 2,000 euros worth of raw olives to AB Supermarkets in Greece. AB supermarkets retailed the olives for 4,000 euros to consumers. Yanni also sells 10,000 euros worth of olives to George who operates an oil press, also in Greece. George sells 18,000 euros worth of extra virgin olive oil to ItaOils, a corporation in Italy that packages oil products. ItaOils exports 30,000 euros worth of bottled extra virgin olive oil to Mustafa center in Singapore, who sold it for the equivalent of 35,000 euros to its customers. ItaOils also exports 10,000 euros worth of bottled extra virgin olive oil to AB Supermarkets in Greece, who retailed it for 18,000 euros.

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14. The activities described in Scenario A have increased Singapore's GDP by how much (in euros)? [4p]
- A. 0 euros.
  - B. 5,000 euros.**
  - C. 8,000 euros.
  - D. 10,000 euros.
  - E. 12,000 euros.
  - F. 18,000 euros.
  - G. 20,000 euros.
  - H. 22,000 euros.
  - I. 30,000 euros.
  - J. 35,000 euros.
  - K. 57,000 euros.

*[From the scenario we can calculate the value added by each actor.*

*- Yanni (Greece) added value of  $10k+2k=12k$  euros.*

*- George (Greece) added value of  $18k-10k=8k$  euros.*

*- ItaOils (Italy) added value of  $30k+10k-18k=22k$  euros.*

*- Mustafa (Singapore) added value  $35k-30k=5k$  euros.*

*- AB Supermarkets (Greece) added value  $18k-10k+4k-2k=10k$  euros.*

*Singapore's GDP was affected only by Mustafa center for  $+5k$  euros]*

15. The activities described in Scenario A have increased Italy's GDP by how much? [4p]

- A. 0 euros.
- B. 5,000 euros.
- C. 8,000 euros.
- D. 10,000 euros.
- E. 12,000 euros.
- F. 18,000 euros.
- G. 20,000 euros.
- H. 22,000 euros.**
- I. 30,000 euros.
- J. 35,000 euros.
- K. 57,000 euros.

*[Italy's GDP was affected only by the activities of ItaOils by  $+22k$  euros]*

16. The activities described in Scenario A have increased Greece's GDP by how much? [4p]

- A. 0 euros.
- B. 5,000 euros.
- C. 8,000 euros.
- D. 10,000 euros.
- E. 12,000 euros.
- F. 18,000 euros.
- G. 20,000 euros.
- H. 22,000 euros.
- I. 30,000 euros.**
- J. 35,000 euros.
- K. 57,000 euros.

*[Greece's GDP was affected by the activities of Yanni, George and AB Supermarkets for  $12 + 8 + 10 = 30k$  euros]*

## Problem B

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*[Scenario B] The demand for bicycles in a town is given by  $p = 550 - 3Q$ , where  $p$  is the price and  $Q$  is the total quantity of bicycles available for sale. The marginal cost for making a bicycle is constant and equal to 10. Two identical manufacturers of bicycles already exist in this town and compete with respect to quantity.*

---

17. What will the profit maximizing price be in scenario B? [4p]

- A. Around 0 dollars.
- B. Around 50 dollars.
- C. Around 100 dollars.
- D. Around 130 dollars.
- E. Around 170 dollars.
- F. Around 190 dollars.**
- G. Around 210 dollars.

*[ $MR_1 = MC$  or  $550 - 6q_1 - 3q_2 = 10$ . Because at equilibrium  $q_1 = q_2$ ,  $550 - 9q_1 = 10$  or  $q_1 = 540/9$  or  $q_1 = q_2 = 60$ . Thus,  $p = 550 - 3(60 + 60) = 190$  dollars]*

18. What will the profit maximizing price be for the two incumbent manufacturers in scenario B, if a third manufacturer enters the market and makes available for sale exactly 60 bicycles not caring for how the two incumbent manufacturers will react? [4p]

- A. Around 0 dollars.
- B. Around 50 dollars.
- C. Around 100 dollars.
- D. Around 130 dollars.**
- E. Around 170 dollars.
- F. Around 190 dollars.
- G. Around 210 dollars.

*[If the third manufacturer makes available for sale 60 bicycles independently of what the other two will do, the demand for the incumbent manufacturers will be  $p = 550 - 3(q_1 + q_2 + 60) = 370 - 3(q_1 + q_2)$ . In this case,  $MR_1 = MC$  is  $370 - 6q_1 - 3q_2 = 10$ . Because at equilibrium  $q_1 = q_2$ ,  $370 - 9q_1 = 10$  or  $q_1 = 360/9$  or  $q_1 = q_2 = 40$ . Thus,  $p = 550 - 3(40 + 40 + 60) = 130$  dollars]*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

19. Present a brief example of someone who has the comparative but not the absolute advantage in something. [7p] **[Limit 80 words]**

*A husband is a worse cook than his wife, but he does the cooking because his wife can earn more money than him by working extra hours. [25 words]*

20. Briefly explain the difference(s) between structural and frictional unemployment. [7p] **[Limit 80 words]**

*Structural unemployment comes from rigidities in the labor market that are permanent. Frictional unemployment comes from processes in the labor market that take time but in the end are resolved. [30 words]*

21. The CB has committed to a specific interest rate and banks have ample reserves. Then, money demand unexpectedly increases. Briefly explain what will happen to the money market. [7p] *[Limit 80 words]*

*The increase in money demand will increase the demand for loans at the prevailing interest rate. Since banks have ample reserves, they will go ahead and provide the demanded credit, increasing the money supply. [34 words]*

22. When you use a debit card for any purchase, the bank withholds 2% commission from the merchant. Based on this fact, a viral TikTok claims the following: "For a \$50 debit transaction, the bank keeps \$1 and the merchant receives only \$49. If the merchant also uses debit to spend the \$49, the next merchant will receive only \$48.02. If all next recipients of the money use debit for their transactions, the amount will keep falling to \$47.06, then 46.12, then \$45.2 etc. and after around 200 debit transactions the amount will have shrunk to less than \$1! This means that banks gradually collected \$49 out of the initial \$50 and only \$1 remained in the real economy!" Explain if this claim is true or false. [7p] *[Limit 80 words]*

*The claim is false and misleading. After 200 transactions, banks have not collected \$49 out of \$50 because the total output that was transacted was  $\$[50 + 49 + 48.02 + \dots + 1] = \$2,450^*$ . That is, banks kept 2% of the total transactions for their services, not 98%. [50 words]*

*\*You do not really need to know any complicated formulas to find that the total value of transactions is \$2,450. Once you understand that the \$49 collected by banks should be the 2% of total transactions, you can calculate  $49/0.02 = 2,450$ .*

END OF TASKS



## MidtermTest

Sep. 29, 2023

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. Which of the following fallacies is relevant to the statement: "Before it rains, there are always clouds"? [4pt]
  - A. The fallacy of composition.
  - B. The post hoc ergo propter hoc fallacy.
  - C. The Ceteris Paribus.
  - D. The representative agent.
  - E. The statement is not a fallacy.
  
2. In order to produce a TikTok video I need:
  - to dedicate 2 hours of work,
  - to use equipment worth \$12k,
  - to pay my video editor guy \$50.If I was not producing the video, I could use my time to do consulting, which pays \$500 per hour and rent out my equipment for \$80 per day. How much is the opportunity cost of a video? [4pt]
  - A. 0 dollars.
  - B. 500 dollars.
  - C. 1,000 dollars.
  - D. 1,050 dollars.
  - E. 1,080 dollars.
  - F. 1,130 dollars.
  - G. 12,000 dollars.
  - H. 13,000 dollars.
  - I. 13,050 dollars.
  - J. 13,080 dollars.
  - K. 13,130 dollars.
  
3. An industry consists of 12 firms, each producing a slightly differentiated product. If a firm lowers its price by a small amount, it will cause a negligible loss of market share for the rest of the firms. Which of the following is the most appropriate model to analyze this industry? [4pt]
  - A. Perfect Competition.
  - B. Monopoly.
  - C. Monopolistic Competition.
  - D. Cournot Oligopoly.
  - E. Bertrand Oligopoly.
  - F. Kinked-demand model.

4. A factory produces 500 aluminum ladders per day. Total cost is \$15,400 and the price of a ladder is \$52. If the factory produces one more ladder, total cost will be \$15,420 and the price of a ladder would fall to 51.90\$. Which of the following is most likely the case? [4pt]
- A. This factory produces the optimal quantity of ladders.
  - B. This factory produces less than the optimal quantity of ladders.
  - C. This factory produces more than the optimal quantity of ladders.
  - D. This factory must increase the price.
  - E. This factory must decrease the price.
5. Which of the following surely entails that a firm has market power? [4pt]
- A. The firm's product is physically different than rival products.
  - B. The firm faces a downward sloping demand for its brand.
  - C. The firm has positive short-run profit.
  - D. More rival firms cannot enter the industry because of barriers to entry.
  - E. The firm advertises its product.
6. A profit maximizing PC firm has positive short-run profit. Which of the following is true? [4pt]
- A. The firm faces a higher demand than its rivals.
  - B. The firm operates at diminishing returns.
  - C. Both of the above are true.
  - D. None of the above is true.
7. A monopolistically competitive market is at L-R equilibrium. Which of the following is true? [4pt]
- A. Firms have market power.
  - B. Firms earn zero profit.
  - C. More firms than optimal have entered the industry.
  - D. A DWL exists.
  - E. All of the above.
8. Which of the following a regulator CANNOT do to a monopoly market? [4pt]
- A. Completely eliminate the DWL.
  - B. Set a price ceiling below the monopoly price.
  - C. Make the monopolist sell more than the competitive quantity.
  - D. Lower the profit of the monopolist.
  - E. Impose a per-unit tax on the monopolist's product.
9. A rational regulator sets a price floor for portobello mushrooms. Given that this market is nearly perfectly competitive, what is most likely the intention of the regulator? [4pt]
- A. To increase the production of mushrooms in the market.
  - B. To decrease the DWL in the market.
  - C. To increase the consumer surplus in the market.
  - D. To increase the producer surplus in the market.
  - E. All of the above.

10. A market follows the kinked-demand model. Which of the following is true? [4pt]
- Collusion is somehow established around the prevailing price.
  - Each firm cannot verify with certainty the demand and cost conditions of its rivals.
  - Rival firm executives do not trust each other.
  - All of the above.
11. If Larry plays LoL for 3 hours, his marginal utility is -8 (negative 8). Which of the following is true? [4pt]
- Larry does not enjoy playing LoL.
  - Larry would prefer to play LoL for 2 hours instead of 3 hours.
  - Larry would prefer to play LoL for 4 hours instead of 3 hours.
  - The statement gives us no substantial information for Larry's preferences regarding playing LoL.
12. Suppose that the rent for a firm's office space increases by 20%. Which of the following is true for the firm's MC? [4pt]
- MC will NOT be affected.
  - MC will increase by less than 20%.
  - MC will increase by around 20%.
  - MC will increase by more than 20%.
13. Which of the following is true for a natural monopoly that is regulated for sustainability? [4pt]
- It needs to be subsidized by the government budget every fiscal year.
  - It maximizes the access of people to the product or service.
  - Its price is equal to MC.
  - None of the above.

## Problem A

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*[Scenario A] Firm A creates an externality towards firm B. The externality reduces Firm B's profits by  $d$  per year. Firm A can resolve the externality by investing  $i$  dollars per year. Firm A's profit is  $\pi$  per year.*

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14. According to scenario A, if  $i > d > \pi$ , how could this situation be resolved so no firm would be worse off? [4pt]
- Firm B will buy firm A by paying  $\pi$  per year and shut it down.
  - Firm B will undertake firm A's investment by paying  $i$  per year to it.
  - Firm B will continue to bear the cost of externality.
15. According to scenario A, if  $\pi > i > d$ , how could this situation be resolved so no firm would be worse off? [4pt]
- Firm B will buy firm A by paying  $\pi$  per year and shut it down.
  - Firm B will undertake firm A's investment by paying  $i$  per year to it.
  - Firm B will continue to bear the cost of externality.
16. According to scenario A, if  $d > \pi > i$ , how could this situation be resolved, so no firm would be worse off? [4pt]
- Firm B will buy firm A by paying  $\pi$  per year and shut it down.
  - Firm B will undertake firm A's investment by paying  $i$  per year to it.
  - Firm B will continue to bear the cost of externality.

## Problem B

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*[Scenario B] Two firms share the market demand  $p = 150 - 2Q$ , where  $p$  is the price and  $Q$  the total quantity sold in the market. AVC for either firm is constant and equal to 30. Fixed costs are zero.*

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17. According to scenario B, what will the profit maximizing price be if the two firms compete in quantities? [4pt]
- A. Around \$10.
  - B. Around \$30.
  - C. Around \$50.
  - D. Around \$70.
  - E. Around \$90.
  - F. Around \$110.
18. According to scenario B, what will the profit maximizing price be if the two firms collude? [4pt]
- A. Around \$10.
  - B. Around \$30.
  - C. Around \$50.
  - D. Around \$70.
  - E. Around \$90.
  - F. Around \$110.
19. According to scenario B, briefly explain what prevents the two firms from colluding. [7pt] *[Limit 80 words]*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

20. An industry has 2 identical Cournot duopolists facing the same demand and cost conditions. The profit maximizing quantity for each seller is 60 units. However, seller A correctly believes that seller B will put for sale 70 units instead of 60. Briefly explain how seller A should optimally react and why. [7pt] *[Limit 80 words]*

21. Explain what is "rent-seeking" without using any examples. [7pt] *[Limit 80 words]*

22. The table shows the payoffs for Peggy and Hank under two alternative plans: A and B.

	Peggy	Hank
Plan A	\$50	\$50
Plan B	\$10	\$55

Hank has the right to choose the plan. How much is the DWL and how can a regulator eliminate it? [7pt]

*[Limit 80 words]*

END OF TASKS

## Midterm Test

Sep. 29, 2023

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. Which of the following fallacies is relevant to the statement: "Before it rains, there are always clouds"? [4pt]
  - A. The fallacy of composition.
  - B. The post hoc ergo propter hoc fallacy.
  - C. The Ceteris Paribus.
  - D. The representative agent.
  - E. The statement is not a fallacy.** [*Since clouds (water vapor) is what indeed produces the rain, the statement is not a fallacy*]
2. In order to produce a TikTok video I need:
  - to dedicate 2 hours of work,
  - to use equipment worth \$12k,
  - to pay my video editor guy \$50.If I was not producing the video, I could use my time to do consulting, which pays \$500 per hour and rent out my equipment for \$80 per day. How much is the opportunity cost of a video? [4pt]
  - A. 0 dollars.
  - B. 500 dollars.
  - C. 1,000 dollars.
  - D. 1,050 dollars.
  - E. 1,080 dollars.**
  - F. 1,130 dollars.
  - G. 12,000 dollars.
  - H. 13,000 dollars.
  - I. 13,050 dollars.
  - J. 13,080 dollars.
  - K. 13,130 dollars.

*[Opportunity cost refers to: my labor of 2 hours by 500 dollars each; and the capital I own and use for 1 day by 80 dollars. Total opportunity cost is 1,080 dollars. The \$12k is an explicit fixed cost and the \$50 is an explicit labor cost]*

3. An industry consists of 12 firms, each producing a slightly differentiated product. If a firm lowers its price by a small amount, it will cause a negligible loss of market share for the rest of the firms. Which of the following is the most appropriate model to analyze this industry? [4pt]
- Perfect Competition.
  - Monopoly.
  - Monopolistic Competition.**
  - Cournot Oligopoly.
  - Bertrand Oligopoly.
  - Kinked-demand model.
- [We have only 12 firms which rules out A and B. We have negligible interaction which rules out D, E and F]*
4. A factory produces 500 aluminum ladders per day. Total cost is \$15,400 and the price of a ladder is \$52. If the factory produces one more ladder, total cost will be \$15,420 and the price of a ladder would fall to 51.90\$. Which of the following is most likely the case? [4pt]
- This factory produces the optimal quantity of ladders.
  - This factory produces less than the optimal quantity of ladders.
  - This factory produces more than the optimal quantity of ladders.**
  - This factory must increase the price.
  - This factory must decrease the price.
- [The MC for the 501<sup>st</sup> ladder is  $15,420 - 15,400 = 20$  dollars. The Revenue from 501 ladders is  $51.90 \cdot 501 = 26,001.9$ . The revenue from 500 ladders is  $52 \cdot 500 = 26,000$ . The MR for producing the 501<sup>st</sup> ladder is  $26,001.9 - 26,000 = 1.9$  dollars.  $MR < MC$ , thus this firm most likely produces over the optimal quantity]*
5. Which of the following surely entails that a firm has market power? [4pt]
- The firm's product is physically different than rival products. *[Consumers may still perceive the products as homogeneous]*
  - The firm faces a downward sloping demand for its brand.** *[Impossible to price above MC if your demand curve does not have negative slope]*
  - The firm has positive short-run profit. *[Even a PC firm with no market power can have S-R profit]*
  - More rival firms cannot enter the industry because of barriers to entry. *[Even Bertrand competitors can have barriers of entry but still  $p = MC$ ]*
  - The firm advertises its product. *[Any product with or without market power could be advertised]*
6. A profit maximizing PC firm has positive short-run profit. Which of the following is true? [4pt]
- The firm faces a higher demand than its rivals. *[In PC products are homogeneous]*
  - The firm operates at diminishing returns.** *[If this firm has profit, it means that  $p = MC$  occurs above the AC. That is, at equilibrium,  $MC > AC$ . Since MC intersects with AC at AC's minimum, AC must be increasing. Thus, at  $p = MC$  the firm experiences diminishing returns]*
  - Both of the above are true.
  - None of the above is true.

7. A monopolistically competitive market is at L-R equilibrium. Which of the following is true? [4pt]
- Firms have market power. *[True because the brand's demand is downward sloping]*
  - Firms earn zero profit. *[True because of entry]*
  - More firms than optimal have entered the industry. *[True because the LAC is not minimum]*
  - A DWL exists. *[True because less quantity than the competitive is produced]*
  - All of the above.**
8. Which of the following a regulator CANNOT do to a monopoly market? [4pt]
- Completely eliminate the DWL. *[It can if it sets a price ceiling at the competitive price]*
  - Set a price ceiling below the monopoly price. *[It can, that is what regulators do]*
  - Make the monopolist sell more than the competitive quantity.** *[This is a case of "overshooting"]*
  - Lower the profit of the monopolist. *[Any binding price ceiling will cause this]*
  - Impose a per-unit tax on the monopolist's product. *[It can, that is what regulators do]*
9. A rational regulator sets a price floor for portobello mushrooms. Given that this market is nearly perfectly competitive, what is most likely the intention of the regulator? [4pt]
- To increase the production of mushrooms in the market. *[The price floor will cause a surplus even with the existing quantity]*
  - To decrease the DWL in the market. *[Conversely, the price floor will cause a DWL]*
  - To increase the consumer surplus in the market. *[CS will decrease because of the higher price]*
  - To increase the producer surplus in the market.**
  - All of the above.
10. A market follows the kinked-demand model. Which of the following is true? [4pt]
- Collusion is somehow established around the prevailing price. *[Kinked demand assumes some kind of collusion to be already established in the market. That is why firms have a reason to undercut]*
  - Each firm cannot verify with certainty the demand and cost conditions of its rivals. *[If you could verify that your rival drops the price because of cost or demand reasons and not to start a price war with you, the demand would not be kinked]*
  - Rival firm executives do not trust each other. *[If firms trusted each other that no rival has bad intentions, demand would not be kinked]*
  - All of the above.**
11. If Larry plays LoL for 3 hours, his marginal utility is -8 (negative 8). Which of the following is true? [4pt]
- Larry does not enjoy playing LoL.
  - Larry would prefer to play LoL for 2 hours instead of 3 hours.**
  - Larry would prefer to play LoL for 4 hours instead of 3 hours.
  - The statement gives us no substantial information for Larry's preferences regarding playing LoL. *[Marginal utility compares the utility of gaming for 3 hours to the utility of gaming for 2 hours and tells us that the utility for 2 hours is 8 units more than the utility for 3 hours]*
12. Suppose that the rent for a firm's office space increases by 20%. Which of the following is true for the firm's MC? [4pt]
- MC will NOT be affected.**
  - MC will increase by less than 20%.
  - MC will increase by around 20%.
  - MC will increase by more than 20%. *[Rent is a FC and does not affect the MC]*



13. Which of the following is true for a natural monopoly that is regulated for sustainability? [4pt]
- A. It needs to be subsidized by the government budget every fiscal year. [ $p = AC$ ; so, losses are zero]
  - B. It maximizes the access of people to the product or service. [ $p = AC > MC$ ; so, quantity is below the competitive quantity]
  - C. Its price is equal to MC. [ $p = AC > MC$ ]
  - D. None of the above.

## Problem A

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*[Scenario A] Firm A creates an externality towards firm B. The externality reduces Firm B's profits by  $d$  per year. Firm A can resolve the externality by investing  $i$  dollars per year. Firm A's profit is  $\pi$  per year.*

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14. According to scenario A, if  $i > d > \pi$ , how could this situation be resolved so no firm would be worse off? [4pt]
- A. **Firm B will buy firm A by paying  $\pi$  per year and shut it down.**
  - B. Firm B will undertake firm A's investment by paying  $i$  per year to it.
  - C. Firm B will continue to bear the cost of externality.  
*[The cheapest solution is B to buy A and stop the externality earning benefit  $d - \pi$  while A is not worse off]*
15. According to scenario A, if  $\pi > i > d$ , how could this situation be resolved so no firm would be worse off? [4pt]
- A. Firm B will buy firm A by paying  $\pi$  per year and shut it down.
  - B. Firm B will undertake firm A's investment by paying  $i$  per year to it.
  - C. **Firm B will continue to bear the cost of externality.**  
*[Both ways for solving the externality cost more than the damage the externality causes]*
16. According to scenario A, if  $d > \pi > i$ , how could this situation be resolved, so no firm would be worse off? [4pt]
- A. Firm B will buy firm A by paying  $\pi$  per year and shut it down.
  - B. **Firm B will undertake firm A's investment by paying  $i$  per year to it.**
  - C. Firm B will continue to bear the cost of externality.  
*[It is cheaper if B pays  $i$  to stop the externality earning a benefit of  $d - i$  while A is not worse off]*

## Problem B

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*[Scenario B] Two firms share the market demand  $p = 150 - 2Q$ , where  $p$  is the price and  $Q$  the total quantity sold in the market. AVC for either firm is constant and equal to 30. Fixed costs are zero.*

---

17. According to scenario B, what will the profit maximizing price be if the two firms compete in quantities? [4pt]

- A. Around \$10.
- B. Around \$30.
- C. Around \$50.
- D. Around \$70.**
- E. Around \$90.
- F. Around \$110.

*[Demand can be written as  $p = 150 - 2q_1 - 2q_2$ . MR for firm 1 is  $MR_1 = 150 - 4q_1 - 2q_2$ . Because AVC is constant,  $MC = AVC = 30$ . Firm 1 maximizes profit when  $MR_1 = MC$  or  $150 - 4q_1 - 2q_2 = 30$  or because at equilibrium  $q_2 = q_1$ ,  $150 - 4q_1 - 2q_1 = 30$  or  $6q_1 = 120$  or  $q_1 = q_2 = 20$  or  $Q = 40$ . Thus,  $p = 150 - 2 \cdot 40 = \$70$ ]*

18. According to scenario B, what will the profit maximizing price be if the two firms collude? [4pt]

- A. Around \$10.
- B. Around \$30.
- C. Around \$50.
- D. Around \$70.
- E. Around \$90.**
- F. Around \$110.

*[MR for the collusion is  $MR = 150 - 4Q$ ,  $MR = MC$  entails that  $150 - 4Q = 30$  or  $Q = 30$ . Thus,  $p = 150 - 2 \cdot 30 = \$90$ ]*

19. According to scenario B, briefly explain what prevents the two firms from colluding. [7pt] *[Limit 80 words]*

*Collusion is illegal and cannot be enforced by an official institution. If firms collude, they can be cheated upon and end up with a lower profit than if they compete in quantities. So, the safe way for both firms is to compete. [42 words]*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

20. An industry has 2 identical Cournot duopolists facing the same demand and cost conditions. The profit maximizing quantity for each seller is 60 units. However, seller A correctly believes that seller B will put for sale 70 units instead of 60. Briefly explain how seller A should optimally react and why. [7pt] *[Limit 80 words]*

*When the two firms compete, each sets its quantity from its reaction function, in which the quantity of the rival enters with a negative sign. Thus, as B increases  $q_B$ , it is profit maximizing for A to decrease  $q_A$ . If A responded by increasing  $q_A$  instead, price would go too low and A would make less profit. [57 words]*

21. Explain what is "rent-seeking" without using any examples. [7pt] *[Limit 80 words]*

*Rent seeking is when a monopolist spends its resources to unethically secure a dominant position in the market instead of improving its product or producing more of it. [20 words]*

22. The table shows the payoffs for Peggy and Hank under two alternative plans: A and B.

	Peggy	Hank
Plan A	\$50	\$50
Plan B	\$10	\$55

Hank has the right to choose the plan. How much is the DWL and how can a regulator eliminate it? [7pt] *[Limit 80 words]*

*Hank would choose B. Thus, \$65 will be distributed instead of \$100, creating a DWL of \$35. If a regulator received \$5 from Peggy and paid it to Hank for allowing the regulator to choose A, no player would be worse off and the DWL would be eliminated. [48 words]*

END OF TASKS

## Final Exam

Apr. 17, 2023

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. A lawyer can type 180 words per minute and her assistant can type 160 words per minute. The assistant does not have a law degree. Who has the comparative advantage in typing? [4pt]
  - A. The lawyer.
  - B. The assistant.
  - C. Both.
  - D. None of the above.
2. Which of the following is more likely to be monetary policy for stabilization? [4pt]
  - A. Decreasing  $r$  to stimulate investment.
  - B. Decreasing  $r$  to stop inflation.
  - C. Increasing the money supply to address an increase in money demand.
  - D. Decreasing the money demand in order to boost employment.
3. In the commodity market of a closed economy, we observe that  $Y > C + I + G$ . Which of the following is accurate? [4pt]
  - A. It is impossible that  $Y > C + I + G$ .
  - B. Inventories will fall.
  - C. Inventories will increase.
  - D. Saving will fall.
  - E. Saving will increase.
4. An economy is near its steady-state as defined by Solow. Which of the following is accurate? [4pt]
  - A. The economy grows fast.
  - B. The economy does not grow at all.
  - C. The economy grows mainly from technological advancement and human capital improvement.
  - D. The economy can grow only with foreign investment.
5. An economy has  $s = 0.3$ ,  $d = 0.2$ ,  $K = 180$ ,  $Y = 250$ . Which of the following is most likely to be its GDP next year? [4pt]
  - A. 0.
  - B. 200.
  - C. 250.
  - D. 300.

6. Which of the following could facilitate catch-up growth for an economy? [4pt]
- A. Incentives for start-ups that create original technologies.
  - B. An increase in money supply.
  - C. A minimum wage law.
  - D. A tax-cut benefiting foreign investors.
7. Which of the following could help to decrease inflation? [4pt]
- A. An increase in Government spending.
  - B. An increase in taxation.
  - C. An increase in the real interest rate.
  - D. An increase in the labor force.
8. Aaron lends 10K dollars to Betty for one year. In the end of the year Betty will return 10.5K dollars. When Aaron agreed on the loan, inflation was 2%. Which of the following is the case if inflation this year turns out to be 4%? [4pt]
- A. Both will benefit from the unanticipated inflation.
  - B. Aaron will benefit but Betty will be worse off from the unanticipated inflation.
  - C. Aaron will be worse off but Betty will benefit from the unanticipated inflation.
  - D. Both will be worse off from the unanticipated inflation.
9. Which of the following measurements should you use in order to compare peoples' prosperity between Mexico and Turkey for the last 10 years? [4pt]
- A. Total GDP.
  - B. Total real GDP.
  - C. Real GDP growth.
  - D. GDP per capita.
  - E. Real GDP per capita.
  - F. Real GDP per capita PPP.
10. What will happen to a monopoly, if barriers of entry are completely lifted? [4pt]
- A. Nothing.
  - B. Its profit will increase.
  - C. It will go out of business.
  - D. The market will turn into an oligopoly.
  - E. The market will turn into PC.
11. Which of the following is most likely to avoid the Bertrand paradox? [4pt]
- A. When the sellers set prices only once and then keep them for a very long time.
  - B. When products are completely indistinguishable.
  - C. When the market is too big for the sellers to cover.
  - D. When there exist barriers to entry.
12. Which of the following is the most important source of market power for a monopolistically competitive firm? [4pt]
- A. The small number of competitors.
  - B. Product differentiation.
  - C. Barriers of entry.
  - D. Lower AC.
  - E. The monopolistically competitive firm has no market power.

13. Which of the following will shift the demand curve for tea? [4pt]

- A. The price of coffee.
- B. The price of sugar.
- C. Both of the above.
- D. None of the above.

## Problem A

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*[Scenario A] A monopolistically competitive firm faces demand for its brand  $p = 100 - q$ , where  $q$  is the quantity the firm puts for sale. Its marginal cost (MC) is  $0.5q$ , its average variable cost (AVC) is  $0.3q$ , and its fixed cost (FC) is 1,000.*

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14. What is the price that maximizes this firm's profit in scenario A? [4pts]

15. How much is the maximum profit the firm from scenario A can earn? [4pts]

16. How much would the maximum profit be if the firm in scenario A was a pure monopoly? [4pts]

## Problem B

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*[Scenario B] An economist has calculated that the marginal product of labor for a firm is given by*

$$MP_L = \frac{2K}{\sqrt{L}},$$

*where  $K$  is the number of machines and  $L$  is the number of workers. The price of the product is 100 dollars and the wage is 400 dollars.*

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17. How many workers will the firm in scenario B want to hire if it has leased 4 machines? [4pts]

18. For the firm in scenario B, what is the relationship between labor and capital? [4pts]

## Short Answer Tasks

Answer the following questions in no more than 80 words.

19. Tesla Model S became available for sale in June, 2012 and its release signified the modern era of the electric car. Since then, electric cars have become better but also significantly cheaper. Use concepts from the course to briefly explain why prices of electric vehicles keep falling. [7pts] *[2 points penalty for exceeding 80 words]*
  
20. Briefly explain how fiat money retains its value. [7pts] *[2 points penalty for exceeding 80 words]*
  
21. Briefly explain if Singapore's economic organization is mostly left (progressive) or mostly right (conservative). [7pts] *[2 points penalty for exceeding 80 words]*
  
22. In the last decade, we have observed a persistent tendency for international trade to level off or slightly decrease. Briefly state the reason(s) as we discussed them in class. [7pts] *[2 points penalty for exceeding 80 words]*

END OF TASKS

## Final Exam – KEY

Apr. 17, 2023

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. A lawyer can type 180 words per minute and her assistant can type 160 words per minute. The assistant does not have a law degree. Who has the comparative advantage in typing? [4pt]
  - A. The lawyer.
  - B. The assistant.**
  - C. Both.
  - D. None of the above.

*[The assistant has the comparative advantage in typing because the lawyer has something more important to do (practice law) thus, the lawyer has a higher opportunity cost in typing]*
2. Which of the following is more likely to be monetary policy for stabilization? [4pt]
  - A. Decreasing  $r$  to stimulate investment. *[The goal here is to stimulate output, not to stabilize the money market]*
  - B. Decreasing  $r$  to stop inflation. *[Decreasing  $r$  does not stop inflation]*
  - C. Increasing the money supply to address an increase in money demand. [This could stabilize  $r$ ]**
  - D. Decreasing the money demand in order to boost employment. *[Nonsense]*
3. In the commodity market of a closed economy, we observe that  $Y > C + I + G$ . Which of the following is accurate? [4pt]
  - A. It is impossible that  $Y > C + I + G$ . *[It is possible]*
  - B. Inventories will fall.
  - C. Inventories will increase. [Because not all output will be used]**
  - D. Saving will fall. *[Saving is not a part of the commodity market equilibrium]*
  - E. Saving will increase.
4. An economy is near its steady-state as defined by Solow. Which of the following is accurate? [4pt]
  - A. The economy grows fast. *[Near the steady-state, growth is slow]*
  - B. The economy does not grow at all. *[It is not exactly at the steady-state, plus you may have growth because of  $C$  below]*
  - C. The economy grows mainly from technological advancement and human capital improvement. [True, because in this case, the  $Y$  curve will shift upwards]**
  - D. The economy can grow only with foreign investment. *[Not "only". This is usually true for catch-up economies, not the ones near their steady-state]*
5. An economy has  $s = 0.3$ ,  $d = 0.2$ ,  $K = 180$ ,  $Y = 250$ . Which of the following is most likely to be its GDP next year? [4pt]
  - A. 0.
  - B. 200.
  - C. 250.
  - D. 300.**



*[Here  $sY = 75 > dK = 36$ . Thus, GDP (Y) next year will increase above 250. The only option that is consistent with this is D]*

6. Which of the following could facilitate catch-up growth for an economy? [4pt]
- A. Incentives for start-ups that create original technologies. *[This would cause sustained growth]*
  - B. An increase in money supply. *[It may cause a short-run increase in Y]*
  - C. A minimum wage law. *[It will hinder catch-up prospects]*
  - D. **A tax-cut benefiting foreign investors.** *[Foreign investment is necessary for catch-up growth]*
7. Which of the following could help to decrease inflation? [4pt]
- A. An increase in Government spending. *[Could stimulate Y and cause prices to decrease if the CB does not increase the money supply]*
  - B. An increase in taxation. *[If taxation is not on goods but is on income, it may decrease household disposable income, decrease the demand for goods and result to lower prices for goods]*
  - C. **An increase in the real interest rate.** *[This answer is superior to A and B because it will for sure result to less money supply, and thus, prices will drop]*
  - D. An increase in the labor force. *[Nonsense]*
8. Aaron lends 10K dollars to Betty for one year. In the end of the year Betty will return 10.5K dollars. When Aaron agreed on the loan, inflation was 2%. Which of the following is the case if inflation this year turns out to be 4%? [4pt]
- A. Both will benefit from the unanticipated inflation.
  - B. Aaron will benefit but Betty will be worse off from the unanticipated inflation.
  - C. **Aaron will be worse off but Betty will benefit from the unanticipated inflation.**
  - D. Both will be worse off from the unanticipated inflation.
- [Unanticipated inflation always hurts the lender (because they receive less purchasing power than what they expected) and benefits the borrower (because they pay back less purchasing power than they had anticipated). See tutorial video 9 for more]*
9. Which of the following measurements should you use in order to compare peoples' prosperity between Mexico and Turkey for the last 10 years? [4pt]
- A. Total GDP.
  - B. Total real GDP.
  - C. Real GDP growth.
  - D. GDP per capita.
  - E. Real GDP per capita.
  - F. **Real GDP per capita PPP.**
- ['Real' to remove the effect of inflation; 'per capita' because you need to compare 'peoples' prosperity' and 'PPP' in order to adjust for purchasing power in different countries. See tutorial video 7 for more]*
10. What will happen to a monopoly, if barriers of entry are completely lifted? [4pt]
- A. Nothing.
  - B. Its profit will increase. *[If this was true, the monopolist would just abolish the barriers]*
  - C. It will go out of business. *[No because, it would still be able to make zero profit (its opportunity cost)]*
  - D. The market will turn into an oligopoly. *[Oligopoly also requires barriers to entry]*
  - E. **The market will turn into PC.** *[If we remove barriers, entry will occur imitating the monopolist's product till the point that profit will disappear]*

11. Which of the following is most likely to avoid the Bertrand paradox? [4pt]
- A. When the sellers set prices only once and then keep them for a very long time. *[If firms interact only once, they have no reason to not undercut]*
  - B. When products are completely indistinguishable. *[In this case undercutting is more meaningful]*
  - C. When the market is too big for the sellers to cover.** *[In this case undercutting will not yield higher profit]*
  - D. When there exist barriers to entry. *[Barriers of entry are unrelated here]*
12. Which of the following is the most important source of market power for a monopolistically competitive firm? [4pt]
- A. The small number of competitors. *[M. Comp. does not have a small number of firms]*
  - B. Product differentiation.**
  - C. Barriers of entry. *[M. Comp. does not have barriers to entry]*
  - D. Lower AC. *[Lower AC increases profit, not market power]*
  - E. The monopolistically competitive firm has no market power. *[False]*
13. Which of the following will shift the demand curve for tea? [4pt]
- A. The price of coffee. *[The price of a substitute is a demand shifter]*
  - B. The price of sugar. *[The price of a complement is a demand shifter]*
  - C. Both of the above.**
  - D. None of the above.

## Problem A

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*[Scenario A] A monopolistically competitive firm faces demand for its brand  $p = 100 - q$ , where  $q$  is the quantity the firm puts for sale. Its marginal cost (MC) is  $0.5q$ , its average variable cost (AVC) is  $0.3q$ , and its fixed cost (FC) is 1,000.*

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14. What is the price that maximizes this firm's profit in scenario A? [4pts]
- [It should be  $MR = MC$  or  $100 - 2q = 0.5q$  or  $q = 100/2.5$  or  $q = 40$ . Then, from the demand  $p = 100 - 40$  or  $p = 60$ ]*
15. How much is the maximum profit the firm from scenario A can earn? [4pts]
- [ $\Pi = R - C = p \cdot q - AC \cdot q - FC = p \cdot q - 0.3q \cdot q - 1,000 = 60 \cdot 40 - 0.3 \cdot 40 \cdot 40 - 1,000 = 2,400 - 480 - 1,000 = 920$ ]*
16. How much would the maximum profit be if the firm in scenario A was a pure monopoly? [4pts]
- [The demand we are given here is for the firm's brand, assuming that there exist other brands, too. We can tell that the monopoly profit would be above 920 but, if we are not given a market demand for the good, **we cannot tell** exactly]*

## Problem B

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*[Scenario B] An economist has calculated that the marginal product of labor for a firm is given by*

$$MP_L = \frac{2K}{\sqrt{L}},$$

*where  $K$  is the number of machines and  $L$  is the number of workers. The price of the product is 100 dollars and the wage is 400 dollars.*

---

17. How many workers will the firm in scenario B want to hire if it has leased 4 machines? [4pts]

*[It should be  $VMP_L = w$  or  $p \cdot MP_L = w$  or  $p \cdot \frac{2K}{\sqrt{L}} = w$  or  $100 \cdot \frac{2 \cdot 4}{\sqrt{L}} = 400$  or  $\frac{800}{\sqrt{L}} = 400$  or  $\sqrt{L} = \frac{800}{400}$  or  $\sqrt{L} = 2$  or  $L = 4$ ]*

18. For the firm in scenario B, what is the relationship between labor and capital? [4pts]

*[Because from previous question  $p \cdot \frac{2K}{\sqrt{L}} = w$  can be written as  $\sqrt{L} = p \cdot \frac{2K}{w}$  or  $\sqrt{L} = 100 \cdot \frac{2K}{400}$  or  $\sqrt{L} = \frac{K}{2}$ , we can tell that as  $K$  increases,  $L$  increases too. So,  $L$  and  $K$  work in a complementary way for this firm]*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

19. Tesla Model S became available for sale in June, 2012 and its release signified the modern era of the electric car. Since then, electric cars have become better but also significantly cheaper. Use concepts from the course to briefly explain why prices of electric vehicles keep falling. [7pts] **[2 points penalty for exceeding 80 words]**

*There may be several reasons. Improvement in technology. Economies of scale, because more EVs are demanded today. Change in market structure (from a monopoly to oligopoly to M. Comp. etc. [30 words]*

20. Briefly explain how fiat money retains its value. [7pts] **[2 points penalty for exceeding 80 words]**

*Because it is controlled by the CB so that its quantity will not cause inflation. [15 words]*

21. Briefly explain if Singapore's economic organization is mostly left (progressive) or mostly right (conservative). [7pts] **[2 points penalty for exceeding 80 words]**

*It seems that Singapore is a weird mix of both. Lots of government policies (HDB, pension fund investment etc.) suggest a left approach in keeping  $G$  as a serious part of fiscal policy. On the other hand, low taxation, no minimum wage, poor social nets indicate a conservative approach. [49 words]*

22. In the last decade, we have observed a persistent tendency for international trade to level off or slightly decrease. Briefly state the reason(s) as we discussed them in class. [7pts] **[2 points penalty for exceeding 80 words]**

*(a) Decrease in wage differential between the advanced and developing countries. (b) Robotics in production. [13 words]*

END OF TASKS

## MidtermTest

Feb. 24, 2023

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. Some random guy at the Singapore marina is spraying a liquid near the water. A bystander asks him:
  - What are you spraying?
  - Crocodile repellent, the guy answers.
  - But we do not have crocodiles in Singapore, the bystander replies surprised!
  - Indeed, because I am spraying!Which of the following concepts is the source of this joke?
  - A. Ceteris Paribus.
  - B. Post hoc ergo propter hoc fallacy.
  - C. Representative agent.
  - D. Positive externality.
  - E. Non-rivalry.
2. Which of the following is more likely to be an opportunity cost for a flower shop?
  - A. The cost of gasoline the company truck consumes every week.
  - B. The salary of the delivery employee.
  - C. The cost of the flowers.
  - D. The time the owner spends in order to make sure that the business is run properly.
3. An industry has a large number of firms that each one of them produces an identical product, faces the same demand and has equal cost. Which of the following principles is assumed in this statement.
  - A. Ceteris Paribus.
  - B. Post hoc ergo propter hoc fallacy.
  - C. Representative agent.
  - D. Opportunity cost.
  - E. Non-rivalry.
4. Which of the following best describes how a consumer reaches the optimal choice?
  - A. By maximizing utility.
  - B. By minimizing cost.
  - C. By maximizing utility subject to the budget constraint.
  - D. By maximizing profit at the minimum cost.
  - E. By maximizing consumer surplus.
5. Which of the following is accurate for a negatively sloped demand curve?
  - A. It shows how much the consumer is willing to pay for every quantity of the product.
  - B. It expresses the optimal choice of the consumer at each price.
  - C. It will NOT shift when the price or the quantity changes.
  - D. It always contains some elastic and some inelastic points.
  - E. All of the above.

6. Jane inherits 100K dollars from her grandmother. Jane usually spends her money in necessities and traveling. Which of the following is accurate?
- A. Her budget constraint will NOT be affected.
  - B. If necessities are on the vertical axis, her budget constraint will rotate clockwise.
  - C. If necessities are on the vertical axis, her budget constraint will rotate counterclockwise.
  - D. Her budget constraint will shift outwards.
  - E. Her budget constraint will shift inwards.
7. In which of the following situations will the AC curve of a firm NOT shift downwards?
- A. If technology of production improves.
  - B. If the prices of production factors decrease.
  - C. If a larger quantity of output is produced.
  - D. If workers become more productive.
8. Your cost per unit is \$1.7 and the cost per unit of your rival is \$2.2. Currently, you both sell for \$3. Which of the following is predatory pricing?
- A. If both of you increase the price to \$7.
  - B. If you alone increase your price to \$7.
  - C. If you drop your price to \$2.
  - D. None of the above.
9. Which of the following occurs when a product is associated with a positive externality?
- A. The demand by the society exceeds the market demand.
  - B. The socially optimal quantity is above the equilibrium quantity.
  - C. The socially optimal price is above the equilibrium price.
  - D. All of the above.
10. Which of the following may mitigate a negative externality?
- A. A subsidy to the seller.
  - B. A subsidy to the buyers.
  - C. A per-unit tax on the product.
  - D. A price ceiling.
11. The demand curve for apples is negatively sloped and the supply of apples is perfectly vertical. Which of the following is accurate if a per-unit tax is imposed on apples?
- A. The entire burden of the tax will fall on the suppliers.
  - B. The tax will reduce the profits of the suppliers.
  - C. The tax will NOT create a DWL.
  - D. The tax will NOT reduce the consumer surplus.
  - E. All of the above are accurate.
12. Which of the following markets is a good candidate to exhibit a kinked demand?
- A. A pure monopoly.
  - B. A Bertrand oligopoly, where firms compete aggressively with respect to price.
  - C. A Cournot oligopoly, where firms compete aggressively by setting quantities.
  - D. A collusive Cournot oligopoly where there exist issues of trust.

13. My utility from smoking a cigar is -3 and my utility from running is 3. Which of the following is accurate?
- A. I like running twice as much as I like smoking.
  - B. I prefer running than smoking.
  - C. I dislike smoking.
  - D. I like running.
  - E. All of the above are accurate.

## Problem A

---

*[Scenario A] An industry has two identical and symmetrical firms that compete in quantity. Firm's 1 reaction function is*

$$q_1 = \frac{120 - 2q_2}{4}.$$

---

14. How much will firm 1 produce if the two firms in scenario A compete?
15. If a monopoly was running the business in Scenario A, it would produce 30 units. How much will firm 1 produce if it wants to cheat on a collusive agreement with firm 2?
16. If firm 1 from scenario A knows that firm 2 will produce above its Cournot quantity, which of the following is the optimal reaction for firm 1?
17. Explain the rationale behind your answer to question 16. *[Limit 80 words]*

## Problem B

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[Scenario B] A pharmaceutical company discovers a pill against psoriasis and is awarded a patent which allows it to monopolize the market. Assume that there are only two kinds of consumers: 100 wealthy consumers that are willing to pay up to 250 dollars per pill and 900 poor consumers that are willing to pay up to 30 dollars per pill. Each pill costs 10 dollars to make. All of the above are common knowledge.

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18. According to scenario B, what is the profit maximizing price for the pill?
19. According to scenario B, how much is the DWL from the monopolization (that is, how much gains from trade are lost from monopolizing the medication)?
20. Given that the patent from scenario B is an asset that can be sold if the company agrees and that the state is able to tax the wealthy, explain how an impartial regulator could eliminate the DWL. *[Limit 80 words]*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

21. An industry has a demand curve  $p = 600 - 3Q$ , where  $Q$  is the total quantity. If it runs as a monopoly,  $Q = 85$ . If it runs as Perfect Competition,  $Q = 170$ . A regulator is thinking to set a price ceiling of  $p = 50$ . Explain if this is a good or a bad idea. *[Limit 80 words]*
22. A corrupt government wants to privatize a state owned natural monopoly which is currently regulated for efficiency. Explain what argument they may use to calm down any reactions from the public and the opposition. *[Limit 80 words]*

END OF TASKS

## Midterm Test – KEY

Feb. 24, 2023

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. Some random guy at the Singapore marina is spraying a liquid near the water. A bystander asks him:
  - What are you spraying?
  - Crocodile repellent, the guy answers.
  - But we do not have crocodiles in Singapore, the bystander replies surprised!
  - Indeed, because I am spraying!

Which of the following concepts is the source of this joke? [4pt]

- A. Ceteris Paribus.
- B. Post hoc ergo propter hoc fallacy.**
- C. Representative agent.
- D. Positive externality.
- E. Non-rivalry.

*[The correlation between the two events does not necessarily imply causation]*

2. Which of the following is more likely to be an opportunity cost for a flower shop? [4pt]

- A. The cost of gasoline the company truck consumes every week.
- B. The salary of the delivery employee.
- C. The cost of the flowers.
- D. The time the owner spends in order to make sure that the business is run properly.**

*[A, B and C are official expenses by the shop. They must be written in the books. The time of the owner may not be included in the accounting costs of the firm]*

3. An industry has a large number of firms that each one of them produces an identical product, faces the same demand and has equal cost. Which of the following principles is assumed in this statement. [4pt]

- A. Ceteris Paribus. *[Means all other things equal]*
- B. Post hoc ergo propter hoc fallacy. *[It is the fallacy assuming one event caused another because the first preceded the second]*
- C. Representative agent.** *[Means all agents (in this case firms) are simplified and replaced by their average]*
- D. Opportunity cost. *[It is the cost of the best alternative forgone]*
- E. Non-rivalry. *[When the consumption of one good by somebody does not reduce the amount available for others]*

4. Which of the following best describes how a consumer reaches the optimal choice? [4pt]

- A. By maximizing utility.
- B. By minimizing cost.
- C. By maximizing utility subject to the budget constraint.** *[As we spent half a lecture to explain!]*
- D. By maximizing profit at the minimum cost.
- E. By maximizing consumer surplus.



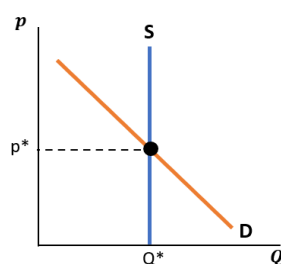
5. Which of the following is accurate for a negatively sloped demand curve? [4pt]
- It shows how much the consumer is willing to pay for every quantity of the product. *[This results from the price at which he is eager to buy that quantity]*
  - It expresses the optimal choice of the consumer at each price. *[This is how much he wants to consume at each price level]*
  - It will NOT shift when the price or the quantity changes. *[Demand shows the relationship between those two]*
  - It always contains some elastic and some inelastic points. *[The upper left points of the curve are elastic while the lower right inelastic]*
  - All of the above.**
6. Jane inherits 100K dollars from her grandmother. Jane usually spends her money in necessities and traveling. Which of the following is accurate? [4pt]
- Her budget constraint will NOT be affected.
  - If necessities are on the vertical axis, her budget constraint will rotate clockwise.
  - If necessities are on the vertical axis, her budget constraint will rotate counterclockwise.
  - Her budget constraint will shift outwards.**
  - Her budget constraint will shift inwards.  
*[Her preferences are not affected. She is just able to buy more of both products now]*
7. In which of the following situations will the AC curve of a firm NOT shift downwards? [4pt]
- If technology of production improves. *[Cost would fall; thus, AC curve would shift downwards]*
  - If the prices of production factors decrease. *[Cost would fall; thus, AC curve would shift downwards]*
  - If a larger quantity of output is produced.** *[It would not affect the AC curve; it is a move along it]*
  - If workers become more productive. *[Cost would fall; thus, AC curve would shift downwards]*
8. Your cost per unit is \$1.7 and the cost per unit of your rival is \$2.2. Currently, you both sell for \$3. Which of the following is predatory pricing? [4pt]
- If both of you increase the price to \$7.
  - If you alone increase your price to \$7.
  - If you drop your price to \$2.
  - None of the above.**  
*[Predatory pricing is when a firm sets a price below its own average cost to make competitors leave the market]*
9. Which of the following occurs when a product is associated with a positive externality? [4pt]
- The demand by the society exceeds the market demand. *[It means that there is redundant social benefit, which is not reflected in the market demand]*
  - The socially optimal quantity is above the equilibrium quantity. *[It is given as the intersection point between supply and "social" demand, which lies above the market demand]*
  - The socially optimal price is above the equilibrium price. *[Society would be willing to pay more in order to obtain more of the product which causes the externality]*
  - All of the above.**
10. Which of the following may mitigate a negative externality? [4pt]
- A subsidy to the seller. *[It would increase the equilibrium quantity]*
  - A subsidy to the buyers. *[It would increase the equilibrium quantity]*
  - A per-unit tax on the product.** *[It would decrease the equilibrium quantity]*

D. A price ceiling. *[It may cause a black market where more of the good may be produced]*

11. The demand curve for apples is negatively sloped and the supply of apples is perfectly vertical. Which of the following is accurate if a per-unit tax is imposed on apples? [4pt]

- A. The entire burden of the tax will fall on the suppliers.
- B. The tax will reduce the profits of the suppliers.
- C. The tax will NOT create a DWL.
- D. The tax will NOT reduce the consumer surplus.
- E. **All of the above are accurate.**

*[The per-unit tax will move the supply curve upwards. However, because the supply is vertical, it will move on itself leaving the equilibrium price and quantity unchanged. So, suppliers will absorb the taxation, which will reduce their profits. CS and DWL will remain the same.]*



12. Which of the following markets is a good candidate to exhibit a kinked demand? [4pt]

- A. A pure monopoly.
- B. A Bertrand oligopoly, where firms compete aggressively with respect to price.
- C. A Cournot oligopoly, where firms compete aggressively by setting quantities.
- D. **A collusive Cournot oligopoly where there exist issues of trust.** *[A kinked demand assumes that there is some kind of fragile collusion established]*

13. My utility from smoking a cigar is -3 and my utility from running is 3. Which of the following is accurate? [4pt]

- A. I like running twice as much as I like smoking. *[Utility is an ordinal measurement, not cardinal]*
- B. **I prefer running than smoking.**
- C. I dislike smoking. *[You must know my utility when I'm not smoking to conclude this]*
- D. I like running. *[You must know my utility when I'm not running to conclude this]*
- E. All of the above are accurate.

## Problem A

---

*[Scenario A] An industry has two identical and symmetrical firms that compete in quantity. Firm's 1 reaction function is*

$$q_1 = \frac{120 - 2q_2}{4}.$$

---

14. How much will firm 1 produce if the two firms in scenario A compete? [4pt]

*If firms compete in quantities, it will be  $q_1 = q_2$  (because firms are identical and symmetrical). Thus,*

$$q_1 = \frac{120 - 2q_2}{4} \text{ or } 4q_1 = 120 - 2q_1 \text{ or } q_1 = q_2 = 20.$$

15. If a monopoly was running the business in Scenario A, it would produce 30 units. How much will firm 1 produce if it wants to cheat on a collusive agreement with firm 2? [4pt]

*If a monopoly would sell 30 units total, in a collusive agreement, each firm would produce 15. Thus,*

$$q_1 = \frac{120 - 2 \cdot 15}{4} \text{ or } q_1 = q_2 = 22.5.$$

16. If firm 1 from scenario A knows that firm 2 will produce above its Cournot quantity, which of the following is the optimal reaction for firm 1? [4pt]

*From the reaction function it is obvious that as  $q_2$  increases,  $q_1$  decreases ( $q_2$  has negative sign). So, if firm 2 increase its quantity above Cournot, it is optimal for firm 2 to drop its own quantity below Cournot.*

17. Explain the rationale behind your answer to question 16. [7pt] *[Limit 80 words]*

*From a first look, it seems that firm 1 just submits to the aggressive strategy of firm 2. If firm 1 replied also aggressively by increasing its quantity, the price would drop, and firm's 1 profit would worsen. Once firm 1 knows that firm 2 will produce more, decreasing quantity is profit maximizing for firm 1. [56 words]*

## Problem B

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*[Scenario B] A pharmaceutical company discovers a pill against psoriasis and is awarded a patent which allows it to monopolize the market. Assume that there are only two kinds of consumers: 100 wealthy consumers that are willing to pay up to 250 dollars per pill and 900 poor consumers that are willing to pay up to 30 dollars per pill. Each pill costs 10 dollars to make. All of the above are common knowledge.*

---

18. According to scenario B, what is the profit maximizing price for the pill? [4pt]

*If the pill is sold above 250 dollars, no one will buy.*

*If it is sold at 250 dollars, profit will be:  $(250 - 10)100 = 24,000$ .*

*If it is sold at any price between 250 and 30 dollars, profit will be below 24,000.*

*If it sold at 30 dollars profit will be:  $(30 - 10)1,000 = 20,000$ .*

*If it is sold below 30 dollars, profit will be below 20,000.*

*The maximum profit is at price 250.*

19. According to scenario B, how much is the DWL from the monopolization (that is, how much gains from trade are lost from monopolizing the medication)? [4pt]

*If the pill is sold at 250 dollars, the 900 poor people cannot buy it. The gains from trade for each one is their willingness to pay (30 dollars) minus the marginal cost of the pill (10 dollars).*

*Thus,  $DWL = (30 - 10)900 = 18,000$ .*

20. Given that the patent from scenario B is an asset that can be sold if the company agrees and that the state is able to tax the wealthy, explain how an impartial regulator could eliminate the DWL. [7pt] *[Limit 80 words]*

*The regulator can tax the 100 wealthy an amount,  $T$  each to buy the patent from the firm. If the pill is offered at the socially optimal price of 30, the regulator will collect 24,000 if  $(30 - 10)1,000 + T = 24,000$*

*or  $20,000 + T = 24,000$  or  $T = 4,000$ . The tax per wealthy person is  $\frac{4,000}{100} = 40$ . The medication costs 30 for the poor and  $30 + 40 = 70$  for the wealthy, while the firm can receive its 24,000 of profit. All three parties (wealthy, poor, and the firm) are happy. [79 words, fewer words would do, here I tried to explain]*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

21. An industry has a demand curve  $p = 600 - 3Q$ , where  $Q$  is the total quantity. If it runs as a monopoly,  $Q = 85$ . If it runs as Perfect Competition,  $Q = 170$ . A regulator is thinking to set a price ceiling of  $p = 50$ . Explain if this is a good or a bad idea. [7pt] *[Limit 80 words]*

*It is a bad idea. The PC price here is  $p = 600 - 3 \cdot 170 = 90$  dollars. This regulator tries to go out of the "box". [21 words]*

22. A corrupt government wants to privatize a state-owned natural monopoly which is currently regulated for efficiency. Explain what argument they may use to calm down any reactions from the public and the opposition. [7pt] *[Limit 80 words]*

*As we said in class, the best way to mislead the people is to point out that this natural monopoly runs with losses and puts a burden on the taxpayers. This is true but it is not caused by mismanagement of the company, but rather a result of maximizing access to the good for social reasons. [56 words]*

END OF TASKS

## Final Exam

Nov. 28, 2022

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. Which of the following may cause nominal GDP to increase and real GDP to remain constant? [4pts]
  - A. An increase in the labor force.
  - B. Technological improvement.
  - C. Unemployment.
  - D. Inflation.
  - E. Decrease in population.
  - F. Increase in productivity.
2. A local company produces an industrial oil pump. Which of the following will most likely be the effect on the local GDP? [4pts]
  - A. GDP from the side of Production will increase.
  - B. GDP from the side of Expenditure will increase.
  - C. GDP from the side of Income will increase.
  - D. All of the above.
3. A country's steady-state real output is \$400 billion. Last year, this country produced \$460 billion worth of real output. Which of the following is possible? [4pts]
  - A. The country recently underwent some kind of economic crisis that has decreased its potential productive ability.
  - B. The country's real output will be less than \$460 billion next year.
  - C. Both of the above.
  - D. None of the above.
4. Which of the following is true according to the Solow model of growth? [4pts]
  - A. Rich countries grow faster than poorer developing countries.
  - B. An increase in the amount of capital will increase the steady-state GDP.
  - C. Poor countries tend to lose more capital than rich countries because of depreciation.
  - D. The increase in capital and output are proportional.
  - E. None of the above.
5. In a scarce reserve regime, banks are required by the Central Bank to hold 20% of deposits as reserves. How much M1 money will be generated by a 50-dollar deposit? [4pts]
  - A. 0 dollars.
  - B. 50 dollars.
  - C. 100 dollars.
  - D. 250 dollars.
  - E. 400 dollars.
  - F. 500 dollars.
  - G. 750 dollars.
  - H. 1,000 dollars.

6. Which of the following refers to a problem of liquidity in a money market? [4pts]
- A. Real output is low and people experience poverty.
  - B. Nominal output is low and people experience poverty.
  - C. There is no sufficient supply of money to cover people's needs for transactions.
  - D. There is high inflation.
  - E. There is low employment.
7. Assume that the Central Bank announces an interest rate cut. Which of the following is a possible complete sequence of events? [4pts]
- A. Increase in C; increase in Y, decrease in Money Demand, increase in Money Supply.
  - B. Increase in I; increase in Y, increase in Money Demand, increase in Money Supply.
  - C. Increase in G; increase in Y, increase in Money Demand, increase in Money Supply.
  - D. Increase in C; increase in I, increase in G.
  - E. Increase in I; increase in Y.
8. Assume that a newly elected conservative government announces expansionary fiscal policy. Which of the following is the most likely complete sequence of events? [4pts]
- A. Increase in G; Increase in Y; increase in Money Demand; increase in Money Supply.
  - B. Increase in G; Increase in Y.
  - C. Decrease in t; Increase in Y; increase in Money Demand; increase in Money Supply.
  - D. Decrease in t; Increase in Y.
9. Consider two countries: country 1 and country 2; and two goods: good A and good B. Which of the following is NOT possible? [4pts]
- A. Country 1 has the absolute advantage in both goods.
  - B. Country 1 has the absolute advantage in good A; country 2 has the absolute advantage in good B.
  - C. Country 1 has the comparative advantage in both goods.
  - D. Country 1 has the comparative advantage in good A; country 2 has the comparative advantage in good B.
10. Which of the following is meant with the phrase: "Money Supply increases ceteris paribus"? [4pts]
- A. Money supply does NOT change.
  - B. Money supply is the only thing that changes.
  - C. Money supply changes because something else changed before.
  - D. The change in Money Supply is correlated with other changes but is NOT caused by them.
11. Which of the following is most likely to be a public good? [4pts]
- A. Preventative health.
  - B. National defense.
  - C. City transportation.
  - D. Electricity.
  - E. Housing.
  - F. Higher education.

12. Which of the following markets is most likely to produce the highest total quantity? [4pts]

- A. A Cournot oligopoly.
- B. A kinked-demand oligopoly.
- C. A monopolistically competitive market.
- D. A cartel.
- E. A monopoly.

13. Which of the following is most likely to happen if the price of gas increases? [4pts]

- A. The demand for gas will decrease.
- B. The supply of gas will increase.
- C. Both of the above.
- D. None of the above.

## Problem A

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*[Scenario A]* Consider an economy, where  $X = M$ . Household's consumption is  $C = 20 + 0.5(Y - T)$ , private investment ( $I$ ) is 180, government spending ( $G$ ) is 130 and the tax coefficient ( $t$ ) is 10%.

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14. How much is the equilibrium output ( $Y$ ) in the economy from scenario A? [4pts]

15. By how much should government spending ( $G$ ) be increased for the equilibrium output ( $Y$ ) to increase by 100 units? [4pts]

## Problem B

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*[Scenario B]* Ramon used to work as a barista making \$120 per day. Recently he started working as a freelance photographer. The market of photoshoots is perfectly competitive and the price is \$100 per session. Ramon's marginal cost which accounts for transportation and materials is  $MC = 10 + 30q$ , where  $q$  is the number of sessions per day. Ramon's fixed cost which accounts for photo equipment is \$40 per working day.

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16. How many photoshoots per day should Ramon do in order to maximize his profit? [3pts]

17. How much is the maximum economic profit per day for Ramon when he is a price-taker? [3pts]
18. How many photoshoots per day should Ramon do if he develops a more favorable reputation for his work than other photographers and clients who want to have photoshoots only with him exhibit a demand  $p = 260 - 10q$ ? [3pts]
19. How much is the maximum economic profit per day for Ramon when he sets his own price according to the demand given above? [3pts]

## Short Answer Tasks

Answer the following questions in no more than 80 words.

20. Briefly explain the main difference between the "scarce reserves regime" and the "ample reserves regime". [7pts] *[2 points penalty for exceeding 80 words]*
21. In the last few months, Central Banks across the world increase the interest rates. What kind of policy is this and why is it applied? [7pts] *[2 points penalty for exceeding 80 words]*



22. A company produces a vastly superior product (in quality, function and durability) than the competition but offers it at a price similar to that of the competition. As a result, its rivals experience a sharp decrease in market share and are gradually forced to shut down. Briefly explain how would the antitrust policy of Singapore address this scenario. [7pts] *[2 points penalty for exceeding 80 words]*

23. Briefly explain what is the difference between "sustained growth" and "catch-up growth". [7pts] *[2 points penalty for exceeding 80 words]*

END OF TASKS

## Final Exam KEY

Nov. 28, 2022

### Multiple Choice Tasks

Select the answer that most closely answers the question.

- Which of the following may cause nominal GDP to increase and real GDP to remain constant? [4pts]
  - An increase in the labor force. *[Should increase both nominal and real GDP]*
  - Technological improvement. *[Should increase both nominal and real GDP]*
  - Unemployment. *[Should decrease both nominal and real GDP]*
  - Inflation.** *[Inflation may not affect real GDP production but affects the value of nominal GDP]*
  - Decrease in population. *[Should decrease both nominal and real GDP]*
  - Increase in productivity. *[Should increase both nominal and real GDP]*
  
- A local company produces an industrial oil pump. Which of the following will most likely be the effect on the local GDP? [4pts]
  - GDP from the side of Production will increase.
  - GDP from the side of Expenditure will increase.
  - GDP from the side of Income will increase.
  - All of the above.**  
*[All three aspects measure exactly the same thing; thus, the company's production will increase GDP from the Production, Expenditure and Income side equally]*
  
- A country's steady-state real output is \$400 billion. Last year, this country produced \$460 billion worth of real output. Which of the following is possible? [4pts]
  - The country recently underwent some kind of economic crisis that has decreased its potential productive ability. *[When actual GDP exceeds the steady-state GDP, some kind of crisis should have recently dropped the steady-state GDP]*
  - The country's real output will be less than \$460 billion next year. *[Since the economy is above its GDP,  $sY < dK$  thus next year the economy will shrink]*
  - Both of the above.**
  - None of the above.
  
- Which of the following is true according to the Solow model of growth? [4pts]
  - Rich countries grow faster than poorer developing countries. *[According to Solow model, rich countries are closer to their steady state GDP, thus they grow slower]*
  - An increase in the amount of capital will increase the steady-state GDP. *[In Solow,  $K$  is on the horizontal axis. A change in  $K$  will not shift any of the curves, thus it will not affect the steady-state]*
  - Poor countries tend to lose more capital than rich countries because of depreciation. *[Rich countries have accumulated higher  $K$ , thus  $dK$  will be higher than in poorer countries]*
  - The increase in capital and output are proportional. *[In Solow model, output exhibits Diminishing Marginal Product of capital. That is, the rise in output is lower than the increase in capital]*
  - None of the above.**

5. In a scarce reserve regime, banks are required by the Central Bank to hold 20% of deposits as reserves. How much M1 money will be generated by a 50-dollar deposit? [4pts]
- 0 dollars.
  - 50 dollars.
  - 100 dollars.
  - 250 dollars.**
  - 400 dollars.
  - 500 dollars.
  - 750 dollars.
  - 1,000 dollars.

$$[Total\ money\ creation\ is\ deposit \cdot \frac{1}{RR} = 50 \cdot \frac{1}{0,20} = 50 \cdot 5 = \$250]$$

6. Which of the following refers to a problem of liquidity in a money market? [4pts]
- Real output is low and people experience poverty.
  - Nominal output is low and people experience poverty.
  - There is no sufficient supply of money to cover people's needs for transactions.**
  - There is high inflation.
  - There is low employment.

*[Liquidity problem in money market means that there is a shortage of money supply in relation to the money demand]*

7. Assume that the Central Bank announces an interest rate cut. Which of the following is a possible complete sequence of events? [4pts]
- Increase in C; increase in Y, decrease in Money Demand, increase in Money Supply. *[Consumption is not directly affected by interest rates]*
  - Increase in I; increase in Y, increase in Money Demand, increase in Money Supply.**
  - Increase in G; increase in Y, increase in Money Demand, increase in Money Supply. *[Government spending is not directly affected by interest rate]*
  - Increase in C; increase in I, increase in G.
  - Increase in I; increase in Y. *[The chain cannot stop at a change of Y without activating link 2]*

8. Assume that a newly elected conservative government announces expansionary fiscal policy. Which of the following is the most likely complete sequence of events? [4pts]
- Increase in G; increase in Y; increase in Money Demand; increase in Money Supply. *[Conservative governments avoid to increase their spending as a means of policy]*
  - Increase in G; increase in Y.
  - Decrease in t; increase in Y; increase in Money Demand; increase in Money Supply.**
  - Decrease in t; increase in Y. *[The chain cannot stop at a change of Y without activating link 2]*

9. Consider two countries: country 1 and country 2; and two goods: good A and good B. Which of the following is NOT possible? [4pts]
- A. Country 1 has the absolute advantage in both goods. *[We saw this in class]*
  - B. Country 1 has the absolute advantage in good A; country 2 has the absolute advantage in good B. *[We saw this in class, too]*
  - C. Country 1 has the comparative advantage in both goods.** *[If a country has the comparative advantage in a production of one good, it means that the opportunity cost of producing it, is lower in comparison to the other country because the other country prefers to produce the other product.]*
  - D. Country 1 has the comparative advantage in good A; country 2 has the comparative advantage in good B. *[This is the standard case]*
10. Which of the following is meant with the phrase: "Money Supply increases ceteris paribus"? [4pts]
- A. Money supply does NOT change.
  - B. Money supply is the only thing that changes.** *[Ceteris paribus means all other things being equal]*
  - C. Money supply changes because something else changed before.
  - D. The change in Money Supply is correlated with other changes but is NOT caused by them.
11. Which of the following is most likely to be a public good? [4pts]
- A. Preventative health. *[It can be excludable]*
  - B. National defense.** *[It is both non-rival and non-excludable]*
  - C. City transportation. *[It can be excludable]*
  - D. Electricity. *[It can be excludable]*
  - E. Housing. *[It can be excludable]*
  - F. Higher education. *[It can be excludable]*
12. Which of the following markets is most likely to produce the highest total quantity? [4pts]
- A. A Cournot oligopoly.
  - B. A kinked-demand oligopoly.
  - C. A monopolistically competitive market.**
  - D. A cartel.
  - E. A monopoly.
- [Monopolistic competition will lead to the lowest price among the other aforementioned market structures, which means that the corresponding quantity produced will be the highest]*
13. Which of the following is most likely to happen if the price of gas increases? [4pts]
- A. The demand for gas will decrease. *[It is the quantity demanded for gas which will decrease, not the demand]*
  - B. The supply of gas will increase. *[It is the quantity of gas supplied which will increase, not the supply]*
  - C. Both of the above.
  - D. None of the above.**

## Problem A

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*[Scenario A]* Consider an economy, where  $X = M$ . Household's consumption is  $C = 20 + 0.5(Y - T)$ , private investment ( $I$ ) is 180, government spending ( $G$ ) is 130 and the tax coefficient ( $t$ ) is 10%.

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14. How much is the equilibrium output ( $Y$ ) in the economy from scenario A? [4pts]

$$[Y = C + I + G \text{ or } Y = 20 + 0.5(Y - 0.10Y) + 180 + 130 \text{ or } Y = 330 + 0.45Y \text{ or } Y = 330/0.55 \text{ or } Y = 600]$$

15. By how much should government spending ( $G$ ) be increased for the equilibrium output ( $Y$ ) to increase by 100 units? [4pts]

$$[If Y = 700 \text{ with unknown } G \text{ we have } 700 = 20 + 0.5(700 - 0.10 \cdot 700) + 180 + G \text{ or } 700 = 515 + G \text{ or } G = 185, \text{ which means that } G \text{ must be increased by } 185 - 130 = 55 \text{ units}]$$

## Problem B

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*[Scenario B]* Ramon used to work as a barista making \$120 per day. Recently he started working as a freelance photographer. The market of photoshoots is perfectly competitive and the price is \$100 per session. Ramon's marginal cost which accounts for transportation and materials is  $MC = 10 + 30q$ , where  $q$  is the number of sessions per day. Ramon's fixed cost which accounts for photo equipment is \$40 per working day.

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16. How many photoshoots per day should Ramon do in order to maximize his profit? [3pts]

$$[Ramon operates at  $p = MC$  or  $100 = 10 + 30q$  or  $30q = 90$  or  $q = 3$ ]$$

17. How much is the maximum economic profit per day for Ramon when he is a price-taker? [3pts]

*[We can calculate his MC for every quantity up to 3. Then, C is the sum of the FC plus all previous MCs.]*

$q$	$MC$	$FC$	$C$
0	-	40	40
1	40	40	80
2	70	40	150
<b>3</b>	<b>100</b>	<b>40</b>	<b>250</b>

*[At  $q = 3$ , his total cost is  $C = 250$  and his revenue  $R = p \cdot q = 100 \cdot 3 = 300$ . So, taking also into account Ramon's opportunity cost (OC) of not working as a barista, his economic profit is  $\Pi = R - C - OC$  or  $\Pi = 300 - 250 - 120$  or  $\Pi = -70$ .]*

18. How many photoshoots per day should Ramon do if he develops a more favorable reputation for his work than other photographers and clients who want to have photoshoots only with him exhibit a demand  $p = 260 - 10q$ ? [3pts]

$$[Ramon's marginal revenue will be  $MR = 260 - 20q$ . Now that he operates as a monopolist, he sets  $MR = MC$  or  $260 - 20q = 10 + 30q$  or  $50q = 250$  or  $q = 5$ ]$$

19. How much is the maximum economic profit per day for Ramon when he sets his own price according to the demand given above? [3pts]

*[Regarding Ramon's daily cost and from the table below we observe that when  $q = 5$ , his total cost is  $C = 540$ . Ramon sets the price at  $p = 260 - 10q = 260 - 10 \cdot 5 = 210$ , so his revenue will be  $R = p \cdot q = 210 \cdot 5 = 1,050$ . So, taking into account Ramon's opportunity cost (OC) of not working as a barista, his economic profit per day will be  $\Pi = R - C - OC = 1,050 - 540 - 120 = 390$ .*

$q$	MC	FC	C
0	-	40	40
1	40	40	80
2	70	40	150
3	100	40	250
4	130	40	380
5	160	40	540

## Short Answer Tasks

Answer the following questions in no more than 80 words.

20. Briefly explain the main difference between the "scarce reserves regime" and the "ample reserves regime". [7pts] **[2 points penalty for exceeding 80 words]**

*In the scarce reserves regime, commercial banks are obligated to reserve a fraction of deposits. All new money is infused in the economy by the Central Bank with open market operations. In the ample reserves regime, the Central Bank gives access to an ample amount of reserves to commercial banks, which they can loan out at the interest rate the Central Bank has defined. [64 words]*

21. In the last few months, Central Banks across the world increase the interest rates. What kind of policy is this and why is it applied? [7pts] **[2 points penalty for exceeding 80 words]**

*This is Contractionary Monetary Policy and is done in order to limit the amount of M1 money in the economy and fight inflation. [23 words]*

22. A company produces a vastly superior product (in quality, function and durability) than the competition but offers it at a price similar to that of the competition. As a result, its rivals experience a sharp decrease in market share and are gradually forced to shut down. Briefly explain how would the antitrust policy of Singapore address this scenario. [7pts] **[2 points penalty for exceeding 80 words]**

*Nothing will be done. In the spirit of antitrust legislation all over the world, it is OK for a company to achieve dominant position in the market because of superior skill or ability to create a superior product. [38 words]*

23. Briefly explain what is the difference between "sustained growth" and "catch-up growth". [7pts] **[2 points penalty for exceeding 80 words]**

*Sustained growth is economic growth for a country due to improvement of its own technology, institutions, human capital or natural resources. Catch-up growth is due to spillovers from the sustained growth of other countries. [34 words]*

END OF TASKS

## Midterm Test

Sep. 30, 2022

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. A movie that is available on Netflix, is which of the following?
  - A. A non-excludable good.
  - B. A non-rival good.
  - C. Both of the above.
  - D. None of the above
2. Which of the following is NOT a characteristic of monopolistic competition?
  - A. Positive long-run profits.
  - B. Differentiated product.
  - C. A downward-sloping demand curve for the firm.
  - D. The presence of DWL.
3. Which of the following market structures should be expected to yield the lowest DWL?
  - A. A Monopoly.
  - B. A Cartel.
  - C. A Cournot Oligopoly.
  - D. A Monopolistically Competitive market.
4. Why is the short-run AC curve initially decreasing?
  - A. Because of Increasing Returns.
  - B. Because of Economies of Scale.
  - C. Because of sunk costs.
  - D. Because of the law of demand.
5. Which of the following is accurate regarding the kinked-demand model?
  - A. The MR curve is discontinuous.
  - B. A change in MC will always cause a change in price.
  - C. Firms never react to price-cuts.
  - D. Profits fall to zero in the long-run.
6. Which of the following policies could reduce methane emissions from the beef industry?
  - A. Taxing vegan products.
  - B. Subsidizing beef producers.
  - C. Subsidizing the consumption of chicken.
  - D. Subsidizing cow milk producers.

7. Which of the following CANNOT be the case when a market is organized as a cartel?
- A. Firms have fixed the price or the quantity.
  - B. Firms maintain significant market power.
  - C. Firms treat the market as a Monopoly.
  - D. Price is below the MR.
  - E. Barriers of entry exist.
8. Amelia has \$450 per month to spend on manicures and personal training. A manicure costs \$60 and a session of personal training \$30. Amelia currently has 4 manicures and 7 sessions of personal training per month. At this combination, Amelia's marginal utility from manicures is 100 and her marginal utility from personal training is 60. Which of the following should she do?
- A. Reduce manicures and increase personal training.
  - B. Increase manicures and reduce personal training.
  - C. Increase both manicures and personal training.
  - D. Reduce both manicures and personal training.
  - E. Not change her consumption.
9. Which of the following market structures is most likely to emerge, when a pharmaceutical company patents a new drug?
- A. A kinked-demand oligopoly.
  - B. A black market.
  - C. A cartel.
  - D. A monopoly.
10. Billy owns a convenient store. His monthly revenue is \$100K. The monthly cost for the products he retails is \$70K. He is NOT paying the \$4K monthly rent for the store because he owns the space. If he was NOT working at his store, he could make a monthly salary of \$5K. How much is Billy's monthly profit?
- A. He is making losses.
  - B. He is making zero profit.
  - C. Around \$10K.
  - D. Around \$20K.
  - E. Around \$30K.
11. The price of Coca-Cola increases. Which of the following is accurate for the demand of Pepsi?
- A. It will increase.
  - B. It will decrease.
  - C. It will NOT change.
12. Which of the following could inform you for the willingness of a consumer to pay for a unit of a product?
- A. The budget constraint.
  - B. The demand curve.
  - C. The MC curve.
  - D. The MR curve.



13. The AC for firm A is \$10 and the AC for firm B is \$8. What price should firm B charge in order to commit "predatory pricing" against firm A?
- A. Any price above \$20.
  - B. Any price above \$10.
  - C. Any price below \$10.
  - D. Any price between \$10 and \$8
  - E. Any price below \$8.

## Problem A

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*[Scenario A] The market demand is  $p = 40 - Q$ , where  $p$  is the price and  $Q$  is the total quantity available for sale. There are two profit maximizing sellers in this market, firm 1 and firm 2. For both firms  $MC = 4$ .*

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14. How much is the profit for firm 1 in scenario A, if firms compete in quantities?
15. How much is the profit for firm 1 in scenario A, if firms collude?
16. How much is the profit for firm 1 in scenario A, if firm 2 produces its collusive quantity and firm 1 cheats?

## Problem B

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*[Scenario B] Production for a particular good has  $MC = 2$  and  $TC = 500 + 2Q$ , where  $Q$  is the total quantity available for sale. The demand for the product is  $p = 102 - 2Q$ , where  $p$  is the price.*

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17. Using only information provided by scenario B, explain why this particular industry may become a natural monopoly. *[Limit 80 words]*

18. According to scenario B, what will be the profit if a single profit maximizing firm operates in the industry?

19. According to scenario B, what will be the profit if a regulator sets the price equal to marginal cost?

## Short Answer Tasks

Answer the following questions in no more than 80 words.

20. Monopolies are known to produce small quantities in order to keep the price high. Yet, we observe that some monopolies invest in production capacity much larger than what they actually need. Explain why.

*[Limit 80 words]*

21. In several instances in the course, we used the term "gains from trade". Define precisely the term and explain how it can be calculated. *[Limit 80 words]*

22. Briefly explain what is the market characteristic that determines whether a firm will have positive long-run profit or not? *[Limit 80 words]*

END OF TASKS

## Midterm Test KEY

Sep. 30, 2022

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. A movie that is available on Netflix, is which of the following?
  - A. A non-excludable good. *[One must pay a subscription to access Netflix]*
  - B. A non-rival good.** *[If one watches the movie, others are not precluded from doing so]*
  - C. Both of the above.
  - D. None of the above
2. Which of the following is NOT a characteristic of monopolistic competition?
  - A. Positive long-run profits.** *[Free entry eliminates L-R profits]*
  - B. Differentiated product. *[One of the basic assumptions of monopolistic competition]*
  - C. A downward-sloping demand curve for the firm. *[Due to product differentiation firms have some market power and perceive a downward-sloping demand curve]*
  - D. The presence of DWL. *[A small DWL still exists in monopolistic competition]*
3. Which of the following market structures should be expected to yield the lowest DWL?
  - A. A Monopoly.
  - B. A Cartel.
  - C. A Cournot Oligopoly.
  - D. A Monopolistically Competitive market.** *[Because in Monopolistic Competition, firms have the least amount of market power compared to Monopoly, Cartel and Cournot Oligopoly]*
4. Why is the short-run AC curve initially decreasing?
  - A. Because of Increasing Returns.**
  - B. Because of Economies of Scale. *[EoS apply in the long-run]*
  - C. Because of sunk costs. *[It has nothing to do with the slope of AC curve]*
  - D. Because of the law of demand. *[It has nothing to do with the slope of AC curve]*
5. Which of the following is accurate regarding the kinked-demand model?
  - A. The MR curve is discontinuous.** *[Because of the demand curve being kinked, MR curve is discontinuous]*
  - B. A change in MC will always cause a change in price. *[Below the prevailing price and for small changes is MC, firm does not take the risk of upsetting the industry by changing the price]*
  - C. Firms never react to price-cuts. *[Firms actually overreact to price cuts]*
  - D. Profits fall to zero in the long-run. *[There is no entry in the L-R in oligopoly because of barriers]*

6. Which of the following policies could reduce methane emissions from the beef industry?
- Taxing vegan products. *[It would increase the demand for beef products]*
  - Subsidizing beef producers. *[It would cause an increase in the supply of beef]*
  - Subsidizing the consumption of chicken.** *[It would decrease the demand for beef causing a decline in production and thus emissions]*
  - Subsidizing cow milk producers. *[It would cause an increase in the supply of beef]*
7. Which of the following CANNOT be the case when a market is organized as a cartel?
- Firms have fixed the price or the quantity. *[This is what a cartel does]*
  - Firms maintain significant market power. *[In a cartel, firms can raise the price above MC]*
  - Firms treat the market as a Monopoly. *[Firms in cartels exploit the market in a Monopolistic way]*
  - Price is below the MR.** *[This can NEVER happen in any market structure]*
  - Barriers of entry exist. *[It is a basic assumption for oligopolistic markets]*
8. Amelia has \$450 per month to spend on manicures and personal training. A manicure costs \$60 and a session of personal training \$30. Amelia currently has 4 manicures and 7 sessions of personal training per month. At this combination, Amelia's marginal utility from manicures is 100 and her marginal utility from personal training is 60. Which of the following should she do?
- Reduce manicures and increase personal training.**
  - Increase manicures and reduce personal training.
  - Increase both manicures and personal training.
  - Reduce both manicures and personal training.
  - Not change her consumption.
- [The marginal utility per dollar for Amelia is  $100/60 = 1.66$  for manicure and  $60/30 = 2$  for personal training. Therefore, a unit of utility from manicure costs more to her than a unit of utility from personal training. She should reduce manicures and increase personal training]*
9. Which of the following market structures is most likely to emerge, when a pharmaceutical company patents a new drug?
- A kinked-demand oligopoly.
  - A black market.
  - A cartel.
  - A monopoly.**
  - Monopolistic competition.*
- [By patenting a new drug, the law forbids any other firm to operate in this market]*
10. Billy owns a convenient store. His monthly revenue is \$100K. The monthly cost for the products he retails is \$70K. He is NOT paying the \$4K monthly rent for the store because he owns the space. If he was NOT working at his store, he could make a monthly salary of \$5K. How much is Billy's monthly profit?
- He is making losses.
  - He is making zero profit.
  - Around \$10K.
  - Around \$20K.**
  - Around \$30K.
- [Billy's total monthly cost includes the \$70K he pays for the products he retails, the \$4K opportunity cost of not renting his store out to someone else and the \$5K opportunity cost of not working for another company. Thus, his monthly profit is  $100K - 70K - 4K - 5K = \$21K$ ]*

11. The price of Coca-Cola increases. Which of the following is accurate for the demand of Pepsi?

- A. **It will increase.**
- B. It will decrease.
- C. It will NOT change.

*[Since Coke is a substitute for Pepsi, the increase in Coke's price will lead to an increase in the demand for Pepsi]*

12. Which of the following could inform you for the willingness of a consumer to pay for a unit of a product?

- A. The budget constraint.
- B. **The demand curve.**
- C. The MC curve.
- D. The MR curve.

*[The demand curve relates the quantity demanded for a product at every price level. Thus, informs us about how much the consumers are willing to pay for every unit of the product]*

13. The AC for firm A is \$10 and the AC for firm B is \$8. What price should firm B charge in order to commit "predatory pricing" against firm A?

- A. Any price above \$20.
- B. Any price above \$10.
- C. Any price below \$10.
- D. Any price between \$10 and \$8
- E. **Any price below \$8.** *[Predatory pricing requires that a seller charges below its own cost with the intention to drive the rivals out of business]*

## Problem A

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*[Scenario A] The market demand is  $p = 40 - Q$ , where  $p$  is the price and  $Q$  is the total quantity available for sale. There are two profit maximizing sellers in this market, firm 1 and firm 2. For both firms  $MC = 4$ .*

---

14. How much is the profit for firm 1 in scenario A, if firms compete in quantities?

- A. Zero.
- B. Around \$80.
- C. Around \$110.
- D. **Around \$145.**
- E. Around \$160.
- F. Around \$180.
- G. Around \$205.
- H. Around \$225.

*[ $MR_1 = MC$  or  $40 - q_2 - 2q_1 = 4$  or  $2q_1 = 36 - q_2$  or  $q_1 = 18 - 0.5q_2$ , which is the reaction function for firm 1. Since we know that at equilibrium  $q_1 = q_2$ , we can write the reaction function as  $q_1 = 18 - 0.5q_1$  or  $q_1 = 12 = q_2$ . By the demand curve, price is  $p = 40 - (q_1 + q_2) = 40 - 24$  or  $p = 16$ . So, profit for firm 1 is  $(p - MC) \cdot q_1 = (16 - 4) \cdot 12 = 144$ ]*

15. How much is the profit for firm 1 in scenario A, if firms collude?

- A. Zero.
- B. Around \$80.
- C. Around \$110.
- D. Around \$145.

- E. Around \$160.
- F. Around \$180.
- G. Around \$205.
- H. Around \$225.

*[MR = MC or  $40 - 2Q = 4$  or  $Q = 18$ , which means that each firm will produce 9 units. By the demand curve, price is  $p = 40 - 18 = 22$ , so profit for firm 1 is  $(p - MC) \cdot q_1 = (22 - 4) \cdot 9 = 162$ ]*

16. How much is the profit for firm 1 in scenario A, if firm 2 produces its collusive quantity and firm 1 cheats?

- A. Zero.
- B. Around \$80.
- C. Around \$110.
- D. Around \$145.
- E. Around \$160.
- F. **Around \$180.**
- G. Around \$205.
- H. Around \$225.

*[Firm 1 will assume that  $q_2 = 9$  and will plug this into its reaction function:  $q_1 = 18 - 0.5q_2$  or  $q_1 = 18 - 4.5$  or  $q_1 = 13.5$ . By the demand curve, price will be  $p = 40 - (9 + 13.5) = 17.5$ . Profit for firm 1 will be  $(17.5 - 4) \cdot 13.5 = 182.25$ ]*

## Problem B

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*[Scenario B] Production for a particular good has  $MC = 2$  and  $TC = 500 + 2Q$ , where  $Q$  is the total quantity available for sale. The demand for the product is  $p = 102 - 2Q$ , where  $p$  is the price.*

---

17. Using only information provided by scenario B, explain why this particular industry may become a natural monopoly. *[Limit 80 words]*

*[This industry could become a natural monopoly because the AC, being equal to  $\frac{TC}{Q} = \frac{500}{Q} + 2$  is decreasing as  $Q$  increases. This implies that this industry exhibits persistent Economies of Scale. Thus, a single firm can produce the entire output at a lower cost than if there were several firms] (44 words)*

18. According to scenario B, what will be the profit if a single profit maximizing firm operates in the industry?

- A. Around -\$500 (losses).
- B. Around -\$250 (losses).
- C. Around 0.
- D. Around \$250.
- E. Around \$500.
- F. **Around \$750.**
- G. Around \$1,000.

*[MR = MC or  $102 - 4Q = 2$  or  $Q = 25$ . By the demand curve, price  $p = 102 - 2 \cdot 25 = 52$ , so profit for the firm is  $p \cdot Q - TC = 52 \cdot 25 - (500 + 2 \cdot 25) = 1,300 - 550 = 750$ ]*

19. According to scenario B, what will be the profit if a regulator sets the price equal to marginal cost?

- A. **Around -\$500 (losses).**
- B. Around -\$250 (losses).
- C. Around 0.
- D. Around \$250.

- E. Around \$500.
- F. Around \$750.
- G. Around \$1,000.

*[If  $p = MC = 2$ , we identify from the demand curve the quantity to be sold by the monopolist, so  $2 = 102 - 2Q$  or  $Q = 50$ . Therefore, the monopolist's profit will be  $p \cdot Q - TC = 2 \cdot 50 - (500 + 2 \cdot 50) = 100 - 600 = -500$ ]*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

20. Monopolies are known to produce small quantities in order to keep the price high. Yet, we observe that some monopolies invest in production capacity much larger than what they actually need. Explain why.

*[Limit 80 words]*

*[Monopolies invest in excess capacity to maintain a threat for potential entrants. In case of entry, the monopolist can use its scale to increase production and drop the price lower than the other firm's AC, thus making the latter to face losses] (42 words)*

21. In several instances in the course, we used the term "gains from trade". Define precisely the term and explain how it can be calculated. *[Limit 80 words]*

*[Gains from trade is the benefit to the society that can be extracted by a market. It is the difference between what the consumer is willing to pay, minus the cost at which the producer can produce the good. It can be calculated as the sum of consumer and producer surplus or the area between the demand curve and MC or supply, when the demand is above] (67 words – covers all possible correct answers the students could provide)*

22. Briefly explain what is the market characteristic that determines whether a firm will have positive long-run profit or not? *[Limit 80 words]*

*[In order for a firm to maintain positive profits in the long-run period, there should exist barriers of entry in the market. In the absence of barriers of entry, short-run profits will attract new firms and entry will eliminate the profit margin over time] (44 words)*

## Final Exam

Apr. 25, 2022

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. Which of the following may cause the GDP of a country to appear larger? [4pts]
  - A. An increase in taxation.
  - B. A negative externality.
  - C. A decrease in government spending.
  - D. None of the above.
2. For which of the following should one use GDP per worker? [4pts]
  - A. To measure unemployment.
  - B. To measure labor demand.
  - C. To measure productivity of labor.
  - D. All of the above.
3. A country is growing at an average rate of 7% per year for 10 consecutive years. Which of the following is most likely the case? [4pts]
  - A. That it is a relatively poor country exhibiting catch-up growth.
  - B. That it is a relatively poor country exhibiting sustained growth.
  - C. That it is a developed country exhibiting catch-up growth.
  - D. That it is a developed country exhibiting sustained growth.
4. Which of the following is always true according to the Solow Model? [4pts]
  - A. A country can never have a GDP higher than the steady-state GDP.
  - B. The steady-state GDP will increase if the capital stock of the country increases.
  - C. Ceteris paribus, a country with more capital stock will have higher GDP than a country with a less capital stock.
  - D. The steady-state GDP will NOT be affected by the saving rate.
5. When you buy something with a credit card, the bank pays the seller and later on, you will repay the bank according to the terms of the credit card. Which of the following is true for credit cards? [4pts]
  - A. Credit cards are part of M1.
  - B. Credit cards are part of M2.
  - C. Both of the above.
  - D. None of the above.



6. "I own a group of companies worth 1M euros, a house in Athens worth 300K euros, I have 100K euros in stocks and 1K euros in cash." How much is my money demand in euros? [4pts]
- A. 1.401M euros.
  - B. 401K euros.
  - C. 101K euros.
  - D. 1K euros.
7. Which of the following will ceteris paribus cause an increase to the interest rate? [4pts]
- A. An increase in Investment.
  - B. A decrease in Investment.
  - C. An increase in Saving.
  - D. A decrease in Saving.
  - E. None of the above.
8. The growth rate of an economy is 2%. Which of the following will most likely result in inflation? [4pts]
- A. An increase in M1 by 1%.
  - B. An increase in M1 by 2%.
  - C. An increase in M1 by 3%.
  - D. All of the above.
9. Inflation may be a problem because of which of the following reasons? [4pts]
- A. Because it hurts the poor.
  - B. Because salaries adjust slower than prices.
  - C. Because it hurts those who have debts.
  - D. Because it causes unemployment.
10. Which of the following may cause structural unemployment? [4pts]
- A. Closing down a major job finding website.
  - B. Hotels near the beach laying off staff after the summer is over.
  - C. A recession.
  - D. A minimum wage law.
11. Which of the following is true regarding world trade? [4pts]
- A. Relative to the size of the world economy, there was more trade in 1910 than in 1950.
  - B. The boom in trade after 1970 was fueled by the invention of the internet.
  - C. Today, world commerce is increasing faster than ever.
  - D. World commerce started when Portugal and England first traded cloth and wine in 1817.
  - E. All of the above are true.
12. In which of the following market structures we may observe price fixing? [4pts]
- A. In monopolistic competition.
  - B. In a Bertrand market.
  - C. In a natural monopoly.
  - D. All of the above.

13. Which of the following is most likely to be a monopolistically competitive market? [4pts]

- A. The stock market.
- B. The market for national defense.
- C. The market of 13.3 inch PC laptops.
- D. The market of erectile dysfunction medications.

## Problem A

---

*[Scenario A] A firm's total production per day given its capital depends on the number of workers employed as:*

- with 1 worker, total production is 60 units;
- with 2 workers, total production is 110 units;
- with 3 workers, total production is 150 units;
- with 4 workers, total production is 180 units;
- with 5 workers, total production is 200 units;

*The price of the product is 10 dollars and the wage per day is 250 dollars.*

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14. What is the Value of the Marginal Product of Labor of the 3rd worker? [4pts]

- A. Around 100 dollars.
- B. Around 150 dollars.
- C. Around 200 dollars.
- D. Around 250 dollars.
- E. Around 300 dollars.
- F. Around 350 dollars.
- G. Around 400 dollars.

15. How many workers would be optimal for this firm to hire? [4pts]

- A. 0 workers.
- B. 1 worker.
- C. 2 workers.
- D. 3 workers.
- E. 4 workers.
- F. 5 workers.

## Problem B

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*[Scenario B] Firm 1 and firm 2 serve a market with demand*

$$p = 900 - 3Q.$$

*For both firms, marginal cost is zero.*

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16. According to scenario B, what is the Cournot quantity that each firm will produce? [4pts]

- A. Around 75 units.
- B. Around 80 units.
- C. Around 90 units.
- D. Around 100 units.
- E. Around 110 units.
- F. Around 120 units.

17. According to scenario B, what is the collusion quantity that each firm will produce? [4pts]
- A. Around 75 units.
  - B. Around 80 units.
  - C. Around 90 units.
  - D. Around 100 units.
  - E. Around 110 units.
  - F. Around 120 units.
18. According to scenario B, what is the optimal quantity for firm 1 to produce if it knows that firm 2 will produce 80 units? [4pts]
- A. Around 75 units.
  - B. Around 80 units.
  - C. Around 90 units.
  - D. Around 100 units.
  - E. Around 110 units.
  - F. Around 120 units.

### Short Answer Tasks

Answer the following questions in no more than 80 words.

19. Comparative advantage is the economic concept that motivates international trade. Shortly present an example of the comparative advantage which is NOT related to trade. [7pts] *[2 points penalty for exceeding 80 words]*
20. The government of Singapore will increase the Goods & Services Tax (GST) from 7% to 8% after 1 Jan 2023. Briefly explain how you expect this to affect Singapore's GDP. [7pts] *[2 points penalty for exceeding 80 words]*

21. Monopolies are notorious for taking advantage of the lack of competition to cut down quantity and raise the price. However, many monopolies tend to operate much larger factories than what is actually required for producing the small quantities they sell in the market. Why do those monopolies choose to spend resources for large factories instead of cutting down costs by operating the smaller scale of production that they actually need? [7pts] *[2 points penalty for exceeding 80 words]*

22. One of the basic assumptions for the Solow model to work is that the production function has a concave shape. Name and briefly explain the economic concept behind the concave shape of the production function. [7pts] *[2 points penalty for exceeding 80 words]*

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END OF TASKS

## Final Exam - KEY

Apr. 25, 2022

### Multiple Choice Tasks

Select the answer that most closely answers the question.

- Which of the following may cause the GDP of a country to appear larger? [4pts]
  - An increase in taxation. *[Will cause GDP to decrease]*
  - A negative externality.** *[Will require the citizens to spend money to resolve the externality]*
  - A decrease in government spending. *[Will cause GDP to decrease]*
  - None of the above.
- For which of the following should one use GDP per worker? [4pts]
  - To measure unemployment.
  - To measure labor demand.
  - To measure productivity of labor.** *[Output per worker shows the average productivity of labor as it was discussed in class]*
  - All of the above.
- A country is growing at an average rate of 7% per year for 10 consecutive years. Which of the following is most likely the case? [4pts]
  - That it is a relatively poor country exhibiting catch-up growth.**
  - That it is a relatively poor country exhibiting sustained growth. *[7% is too high to be coming from inside a poor country]*
  - That it is a developed country exhibiting catch-up growth. *[7% is too high to be the growth rate of a developed country which is already close to the steady-state]*
  - That it is a developed country exhibiting sustained growth. *[7% is too high to be the growth rate of a developed country which is already close to the steady-state]*
- Which of the following is always true according to the Solow Model? [4pts]
  - A country can never have a GDP higher than the steady-state GDP. *[Yes, it can, we have explained how]*
  - The steady-state GDP will increase if the capital stock of the country increases. *[The steady-state is affected by 2 curves, none of which shifts with K]*
  - Ceteris paribus, a country with more capital stock will have higher GDP than a country with a less capital stock.** *[Capital is what produces the output. More capital will produce more output]*
  - The steady-state GDP will NOT be affected by the saving rate. *[The saving rate affects the sY curve, thus it does affect the steady-state]*

5. When you buy something with a credit card, the bank pays the seller and later on, you will repay the bank according to the terms of the credit card. Which of the following is true for credit cards? [4pts]
- Credit cards are part of M1.
  - Credit cards are part of M2.
  - Both of the above.
  - None of the above.**
- [A credit card is a loan. It does not fall under M1 or M2]*
6. "I own a group of companies worth 1M euros, a house in Athens worth 300K euros, I have 100K euros in stocks and 1K euros in cash." How much is my money demand in euros? [4pts]
- 1.401M euros.
  - 401K euros.
  - 101K euros.
  - 1K euros.**
- [In this scenario, money demand is only the cash held. Everything else is not means of transaction]*
7. Which of the following will ceteris paribus cause an increase to the interest rate? [4pts]
- An increase in Investment.
  - A decrease in Investment.
  - An increase in Saving.
  - A decrease in Saving.
  - None of the above.**
- [An increase in the interest rate will decrease the Investment and increase the Saving. However, the reverse, an increase in how much households save and how much firms invest will not affect the interest rate]*
8. The growth rate of an economy is 2%. Which of the following will most likely result in inflation? [4pts]
- An increase in M1 by 1%.
  - An increase in M1 by 2%.
  - An increase in M1 by 3%. [The percentage change in money must exceed the percentage growth of output in order to have inflationary pressure in the economy]**
  - All of the above.
9. Inflation may be a problem because of which of the following reasons? [4pts]
- Because it hurts the poor. *[It hurts those who hold cash and cannot re-negotiate their income flows]*
  - Because salaries adjust slower than prices. [Correct]**
  - Because it hurts those who have debts. *[Unanticipated inflation may benefit those who owe money]*
  - Because it causes unemployment. *[Inflation and unemployment are inversely related in the S-R]*
10. Which of the following may cause structural unemployment? [4pts]
- Closing down a major job finding website. *[This will create frictional unemployment]*
  - Hotels near the beach laying off staff after the summer is over. *[This will create seasonal unemployment]*
  - A recession. *This will create cyclical unemployment]*
  - A minimum wage law.**

11. Which of the following is true regarding world trade? [4pts]
- A. **Relative to the size of the world economy, there was more trade in 1910 than in 1950.** *[As discussed in the lecture]*
  - B. The boom in trade after 1970 was fueled by the invention of the internet. *[The internet penetrated society in the beginning of 2000s]*
  - C. Today, world commerce is increasing faster than ever. *[No, it shows signs of leveling off]*
  - D. World commerce started when Portugal and England first traded cloth and wine in 1817. *[This never happened in reality, it was Ricardo's example]*
  - E. All of the above are true.
12. In which of the following market structures we may observe price fixing? [4pts]
- A. In monopolistic competition. *[This model assumes no strategic interaction]*
  - B. In a Bertrand market.**
  - C. In a natural monopoly. *[There is no one else to fix the price with!]*
  - D. All of the above.
13. Which of the following is most likely to be a monopolistically competitive market? [4pts]
- A. The stock market. *[Was presented as an example of a PC market for every traded company]*
  - B. The market for national defense. *[Was presented as an example of public good]*
  - C. The market of 13.3 inch PC laptops.** *[There is differentiation and little interaction]*
  - D. The market of erectile dysfunction medications. *[Was presented as an example of Oligopoly]*

## Problem A

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*[Scenario A] A firm's total production per day given its capital depends on the number of workers employed as:*

- with 1 worker, total production is 60 units;  $[MP_L = 60, VMP_L = 600]$
- with 2 workers, total production is 110 units;  $[MP_L = 50, VMP_L = 500]$
- with 3 workers, total production is 150 units;  $[MP_L = 40, VMP_L = 400]$
- with 4 workers, total production is 180 units;  $[MP_L = 30, VMP_L = 300]$
- with 5 workers, total production is 200 units;  $[MP_L = 20, VMP_L = 200]$

*The price of the product is 10 dollars and the wage per day is 250 dollars.*

---

14. What is the Value of the Marginal Product of Labor of the 3rd worker? [4pts]
- A. Around 100 dollars.
  - B. Around 150 dollars.
  - C. Around 200 dollars.
  - D. Around 250 dollars.
  - E. Around 300 dollars.
  - F. Around 350 dollars.
  - G. Around 400 dollars.**
15. How many workers would be optimal for this firm to hire? [4pts]
- A. 0 workers.
  - B. 1 worker.
  - C. 2 workers.
  - D. 3 workers.
  - E. 4 workers.** *[Up to the 4th worker,  $VMP_L > w$ ]*
  - F. 5 workers.

## Problem B

---

*[Scenario B] Firm 1 and firm 2 serve a market with demand*

$$p = 900 - 3Q.$$

*For both firms, marginal cost is zero.*

---

16. According to scenario B, what is the Cournot quantity that each firm will produce? [4pts]

- A. Around 75 units.
- B. Around 80 units.
- C. Around 90 units.
- D. Around 100 units.**
- E. Around 110 units.
- F. Around 120 units.

*[ $MR = 900 - 6q_1 - 3q_2$ . Then,  $MR = MC$  or  $900 - 6q_1 - 3q_2 = 0$  or  $q_1 = 150 - 0.5q_2$ , which is the reaction function for firm 1. Because firms are symmetric and it must be  $q_1 = q_2$ , the reaction function can be written as  $q_1 = 150 - 0.5q_1$  or  $q_1 = q_2 = 100$ ]*

17. According to scenario B, what is the collusion quantity that each firm will produce? [4pts]

- A. Around 75 units.**
- B. Around 80 units.
- C. Around 90 units.
- D. Around 100 units.
- E. Around 110 units.
- F. Around 120 units.

*[ $MR = 900 - 6Q$ . Then,  $MR = MC$  or  $900 - 6Q = 0$  or  $Q = 150$  or  $q_1 = q_2 = 75$ ]*

18. According to scenario B, what is the optimal quantity for firm 1 to produce if it knows that firm 2 will produce 80 units? [4pts]

- A. Around 75 units.
- B. Around 80 units.
- C. Around 90 units.
- D. Around 100 units.
- E. Around 110 units.**
- F. Around 120 units.

*[The reaction function for firm 1 is  $q_1 = 150 - 0.5q_2$ , for  $q_2 = 80$ ,  $q_1 = 150 - 0.5 \cdot 80 = 110$ ]*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

19. Comparative advantage is the economic concept that motivates international trade. Shortly present an example of the comparative advantage which is NOT related to trade. [7pts] **[2 points penalty for exceeding 80 words]**

*In class we used the example with the chef and his assistant. The chef is better in designing menus and peeling potatoes. Yet, the assistant has the comparative advantage in peeling the potatoes because has nothing better than that to do. [41 words]*



20. The government of Singapore will increase the Goods & Services Tax (GST) from 7% to 8% after 1 Jan 2023. Briefly explain how you expect this to affect Singapore's GDP. [7pts] *[2 points penalty for exceeding 80 words]*

*This would be an example of contractionary fiscal policy with increase in taxation that is expected to ceteris paribus decrease the GDP as it will cause households to have less disposable income for spending. This policy may help curbing inflation or collecting revenue to repay government debt. [47 words]*

21. Monopolies are notorious for taking advantage of the lack of competition to cut down quantity and raise the price. However, many monopolies tend to operate much larger factories than what is actually required for producing the small quantities they sell in the market. Why do those monopolies choose to spend resources for large factories instead of cutting down costs by operating the smaller scale of production that they actually need? [7pts] *[2 points penalty for exceeding 80 words]*

*As we discussed in class, the reason is rent seeking via "building excess capacity". This way, the monopoly can threaten a potential entrant: "if you enter, I have the scale to flood the market and lower price below your cost, while I will still be able to break even due to my economies of scale". This strategy will deter potential entrants. [61 words]*

22. One of the basic assumptions for the Solow model to work is that the production function has a concave shape. Name and briefly explain the economic concept behind the concave shape of the production function. [7pts] *[2 points penalty for exceeding 80 words]*

*The production function's concavity is due to "Diminishing Marginal Product" of capital that causes  $Y$  to increase progressively less as  $K$  increases. This is because as capital increases, the contribution of each additional unit of  $K$  to  $Y$  becomes smaller and smaller. Each additional unit is less critical for production than the previous. [53 words]*

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END OF TASKS

## Midterm Test

Feb. 25, 2022

### Multiple Choice Tasks

Select the answer that most closely answers the question.

- Which of the following is the most likely to produce at the minimum opportunity cost?
  - A Monopolistically Competitive market.
  - A Bertrand Oligopoly.
  - A Cournot Oligopoly.
  - A Monopoly.
  - A Cartel.
  - A Kinked-demand Oligopoly.
- Plan A distributes 10 units to Ann and 10 units to Bob. Plan B distributes 14 units to Ann and 6 units to Bob. Ann has the right to choose the plan. How can a regulator eliminate the DWL?
  - Tax Ann 4 units and give them to Bob in order to choose plan A.
  - Tax Bob 4 units and give them to Ann in order to choose plan A.
  - The DWL cannot be eliminated by regulation in the given situation.
  - There is no DWL in the given situation.
- Which of the following characteristics of an industry is the most likely to lead to a Natural Monopoly?
  - The good produced is extremely important for the nation.
  - There exist barriers of entry.
  - The product is non-rival.
  - Fixed costs are extremely large.
  - MC is constant.
- A bakery makes so delicious bread that no other bakery can survive in the neighborhood. Thus, this bakery has become a monopoly and charges monopolistic prices. Which of the following is accurate?
  - The bakery engages in predatory pricing.
  - The bakery violates the Singapore Competition Act, section 54.
  - The bakery engages in vertical restraints.
  - The bakery engages in price gouging.
  - The bakery does nothing illegal.
- Which of the following is a non-excludable good?
  - A movie.
  - A song.
  - Noise from traffic.
  - The decrease in CO<sub>2</sub> emissions.
  - The Covid-19 vaccine.

6. Firm A and firm B are identical and they compete in a Cournot manner. Initially, they both produce the Cournot quantities but at some point, firm A receives information that firm B intends to increase its quantity. What will the optimal response for firm A be?
- To decrease its quantity.
  - To keep its quantity constant.
  - To increase its quantity, too.
  - Depending on the situation, it can be any of the above.
7. Which of the following is NOT accurate for the kinked-demand oligopoly?
- Collusion is established between the firms but it is fragile.
  - Other firms will not respond if a firm increases its price.
  - The kinked-demand is the market demand.
  - Changes in MC may not cause changes in the price.
8. Who of the following has the most market power in the market of apparel?
- The online world giant of fast fashion SHEIN.
  - UNIQLO, which is almost in every mall.
  - A neighborhood boutique.
9. The area between the demand curve and the supply curve for quantities between 0 and the PC quantity is which of the following?
- The dead-weight loss.
  - The consumer surplus.
  - The producer surplus.
  - The total gains from trade.
10. Which of the following is always equal to the profit of a firm?
- $(p - AC)q - FC$ .
  - $(p - AVC)q - FC$ .
  - $(p - MC)q - FC$ .
  - $MR - MC$ .
  - All of the above.
11. Which of the following could be the short-run total cost of a firm?
- $100q + 3q^2$ .
  - $100 + 5q$ .
  - $2,000 - 0.5q$ .
  - All of the above could be short-run total cost functions.
12. My marginal utility per dollar from transportation exceeds my marginal utility per dollar from dining out. Which of the following will increase my utility?
- Spend more on dining out and less on transportation.
  - Spend less on dining out and more on transportation.
  - Either of the above.
  - None of the above.

13. Pauline has three alternative options for employment: Work at Subway for \$12 per hour; work at Mango for \$15 per hour; Work at the local petrol station for \$14 per hour. What is Pauline's opportunity cost per hour from working at Mango?
- A. Zero.
  - B. Around \$1.
  - C. Around \$2.
  - D. Around \$3.
  - E. Around \$12.
  - F. Around \$14.
  - G. Around \$26.

## Problem A

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*[Scenario A] The market demand is  $p = 840 - 4Q$ , where  $p$  is the price and  $Q$  is the total quantity available for sale. There is a unique profit maximizing seller in this market with  $MC = 2Q$ .*

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14. How much will the seller in scenario A charge?
- A. Around 100 dollars.
  - B. Around 150 dollars.
  - C. Around 275 dollars.
  - D. Around 350 dollars.
  - E. Around 500 dollars.
  - F. Around 640 dollars.
  - G. Around 820 dollars.
15. How much will the price be if the CCCS forces the seller from scenario A to break into 2 identical but independent sellers that compete in a Cournot manner?
- A. Around 100 dollars.
  - B. Around 150 dollars.
  - C. Around 275 dollars.
  - D. Around 350 dollars.
  - E. Around 500 dollars.
  - F. Around 640 dollars.
  - G. Around 820 dollars.
16. What price ceiling should a regulator impose to the seller from scenario A in order to force him to produce as much quantity as possible?
- A. Around 100 dollars.
  - B. Around 150 dollars.
  - C. Around 275 dollars.
  - D. Around 350 dollars.
  - E. Around 500 dollars.
  - F. Around 640 dollars.
  - G. Around 820 dollars.

## Problem B

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[Scenario B] The daily market demand for corporate logo designs is  $p = 150 - 0.15Q$  and the daily market supply is  $p = 30 + 0.09Q$ , where  $Q$  is the total logos and  $p$  is the price for a logo. An individual designer can produce logos with  $MC = 35 + 5q$ , where  $q$  is the quantity of logos designed every day. Find the equilibrium price in the market in scenario B.

---

17. According to scenario B, how many logos will the designer produce per day to maximize profit?
- A. Around 4 logos.
  - B. Around 8 logos.
  - C. Around 16 logos.
  - D. Around 32 logos.
  - E. Around 50 logos.
  - F. Around 100 logos.
18. How many designers could there be in the market from scenario B?
- A. Around 5.
  - B. Around 10.
  - C. Around 30.
  - D. Around 60.
  - E. Around 100.
  - F. Around 200.
  - G. Around 500.

## Short Answer Tasks

Answer the following questions in no more than 80 words.

19. Because of inflationary pressures, the price of milk tends to increase. The government wants to prevent inflation; thus, it passes a law prohibiting any increase in the price of milk. Briefly explain what will happen in the market of milk in the short-run period. *[2 points penalty for exceeding 80 words]*
20. "Governments should stay out of running businesses. Just look around you, the government owns all true monopolies in the economy and they still manage to make losses in almost all of them!". Argue on the economic validity of the statement. *[2 points penalty for exceeding 80 words]*
21. Provide one example of a positive externality followed by one example of a negative externality. *[2 points penalty for exceeding 80 words]*
22. Explain why collusion is difficult in the car industry, where manufacturers have different profit objectives. *[2 points penalty for exceeding 80 words]*

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END OF TASKS

## Midterm Test – KEY

Feb. 25, 2022

### Multiple Choice Tasks

Select the answer that most closely answers the question.

- Which of the following is the most likely to produce at the minimum opportunity cost?
  - A Monopolistically Competitive market.
  - A Bertrand Oligopoly.**
  - A Cournot Oligopoly.
  - A Monopoly.
  - A Cartel.
  - A Kinked-demand Oligopoly.

*[From the price competition and the incentive for undercutting, Bertrand oligopoly leads us to a solution similar to PC, which is the most efficient method of production]*
- Plan A distributes 10 units to Ann and 10 units to Bob. Plan B distributes 14 units to Ann and 6 units to Bob. Ann has the right to choose the plan. How can a regulator eliminate the DWL?
  - Tax Ann 4 units and give them to Bob in order to choose plan A.
  - Tax Bob 4 units and give them to Ann in order to choose plan A.
  - The DWL cannot be eliminated by regulation in the given situation.
  - There is no DWL in the given situation.**

*[Both Plan A and Plan B distribute the same number of units, so, they are equally efficient]*
- Which of the following characteristics of an industry is the most likely to lead to a Natural Monopoly?
  - The good produced is extremely important for the nation. *[This leads to a Government Monopoly, not necessarily natural]*
  - There exist barriers of entry. *[This may lead to a normal Monopoly. Natural Monopolies do not need barriers of entry]*
  - The product is non-rival. *[Nothing to do with Monopoly]*
  - Fixed costs are extremely large.** *[Extremely large fixed costs lead to significant economies of scale, which are required for a Natural Monopoly]*
  - MC is constant. *[Nothing to do with Monopoly]*
- A bakery makes so delicious bread that no other bakery can survive in the neighborhood. Thus, this bakery has become a monopoly and charges monopolistic prices. Which of the following is accurate?
  - The bakery engages in predatory pricing.
  - The bakery violates the Singapore Competition Act, section 54.

- C. The bakery engages in vertical restraints.  
 D. The bakery engages in price gouging.  
 E. **The bakery does nothing illegal.**  
*[Monopoly is OK if you are just better in doing business]*
5. Which of the following is a non-excludable good?  
 A. A movie. *[You can exclude somebody from watching a movie]*  
 B. A song. *[You can exclude somebody from listening to a song]*  
 C. Noise from traffic. *[Noise from traffic is non-excludable, but it is not a good]*  
 D. **The decrease in CO2 emissions.**  
 E. The Covid-19 vaccine. *[You can exclude somebody from taking the COVID-19 vaccine]*
6. Firm A and firm B are identical and they compete in a Cournot manner. Initially, they both produce the Cournot quantities but at some point, firm A receives information that firm B intends to increase its quantity. What will the optimal response for firm A be?  
 A. **To decrease its quantity.**  
 B. To keep its quantity constant.  
 C. To increase its quantity, too.  
 D. Depending on the situation, it can be any of the above.  
*[The optimal response curve in Cournot is always downward sloping. Therefore, when one firm increases its production, the optimal response for the other one is to decrease it]*
7. Which of the following is NOT accurate for the kinked-demand oligopoly?  
 A. Collusion is established between the firms but it is fragile. *[This is true]*  
 B. Other firms will not respond if a firm increases its price. *[This is true]*  
 C. **The kinked-demand is the market demand.** *[The kinked-demand is how a FIRM perceives the demand]*  
 D. Changes in MC may not cause changes in the price. *[This is true]*
8. Who of the following has the most market power in the market of apparel?  
 A. The online world giant of fast fashion SHEIN.  
 B. UNIQLO, which is almost in every mall.  
 C. **A neighborhood boutique.**  
*[Same story with the Super market vs. convenient store example]*
9. The area between the demand curve and the supply curve for quantities between 0 and the PC quantity is which of the following?  
 A. The dead-weight loss.  
 B. The consumer surplus.  
 C. The producer surplus.  
 D. **The total gains from trade.**  
*[As it was discussed in livestream 4]*
10. Which of the following is always equal to the profit of a firm?  
 A.  $(p - AC)q - FC$ . *[FC is included the AC, so in this formula it is double-counted]*  
 B.  $(p - AVC)q - FC$ .  
 C.  $(p - MC)q - FC$ . *[MC cannot be used in this formula]*  
 D.  $MR - MC$ . *[This is actually the marginal profit]*  
 E. All of the above.

11. Which of the following could be the short-run total cost of a firm?
- A.  $100q + 3q^2$ . *[It does not include a fixed cost, so cannot be short-run]*
  - B.  $100 + 5q$ . *[This is consistent]***
  - C.  $2,000 - 0.5q$ . *[Cost cannot be decreasing in  $q$ ]*
  - D. All of the above could be short-run total cost functions.
12. My marginal utility per dollar from transportation exceeds my marginal utility per dollar from dining out. Which of the following will increase my utility?
- A. Spend more on dining out and less on transportation.
  - B. Spend less on dining out and more on transportation.**
  - C. Either of the above.
  - D. None of the above.
- [The utility from dining out is relatively cheaper, so it makes sense to decrease the money I spend on dining out and shift it towards transportation, thus increasing my utility]*
13. Pauline has three alternative options for employment: Work at Subway for \$12 per hour; work at Mango for \$15 per hour; Work at the local petrol station for \$14 per hour. What is Pauline's opportunity cost per hour from working at Mango?
- A. Zero.
  - B. Around \$1.
  - C. Around \$2.
  - D. Around \$3.
  - E. Around \$12.
  - F. Around \$14.**
  - G. Around \$26.
- [Opportunity cost is the benefit forgone from the next BEST alternative only. If Pauline did not work for Mango, she could not be taking both other jobs but only one, the best of the two]*

## Problem A

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*[Scenario A] The market demand is  $p = 840 - 4Q$ , where  $p$  is the price and  $Q$  is the total quantity available for sale. There is a unique profit maximizing seller in this market with  $MC = 2Q$ .*

---

14. How much will the seller in scenario A charge?
- A. Around 100 dollars.
  - B. Around 150 dollars.
  - C. Around 275 dollars.
  - D. Around 350 dollars.
  - E. Around 500 dollars.**
  - F. Around 640 dollars.
  - G. Around 820 dollars.
- [The seller will set the price at:  $MR = MC$  or  $840 - 8Q = 2Q$  or  $10Q = 840$  or  $Q = 84$ . Therefore,  $p = 840 - 4 \cdot 84$  or  $p = 840 - 336$  or  $p = 504$ ]*



15. How much will the price be if the CCCS forces the seller from scenario A to break into 2 identical but independent sellers that compete in a Cournot manner?

- A. Around 100 dollars.
- B. Around 150 dollars.
- C. Around 275 dollars.
- D. Around 350 dollars.**
- E. Around 500 dollars.
- F. Around 640 dollars.
- G. Around 820 dollars.

*[The demand function has now become  $p = 4q_1 - 4q_2$  and marginal cost is  $MC_1 = 2q_1$  and  $MC_2 = 2q_2$ . The price will be set to the point at which:  $MR_1 = MC_1$  or  $840 - 8q_1 - 4q_2 = 2q_1$  and, because  $q_1 = q_2$  we have that  $840 - 8q_1 - 4q_2 = 2q_1$  or  $840 = 14q_1$  or  $q_1 = q_2 = 60$ . Therefore,  $p = 840 - 4 \cdot 60 - 4 \cdot 60$  or  $p = 840 - 480$  or  $p = 360$ ]*

16. What price ceiling should a regulator impose to the seller from scenario A in order to force him to produce as much quantity as possible?

- A. Around 100 dollars.
- B. Around 150 dollars.
- C. Around 275 dollars.**
- D. Around 350 dollars.
- E. Around 500 dollars.
- F. Around 640 dollars.
- G. Around 820 dollars.

*[The maximum quantity which could be produced is the PC quantity. In this case, the price ceiling would be set to the point at which  $p = MC$  or  $840 - 4Q = 2Q$  or  $840 = 6Q$  or  $Q = 140$ . Therefore, price ceiling is equal to  $p = 840 - 4 \cdot 140$  or  $p = 840 - 560$  or  $p = 280$ ]*

## Problem B

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*[Scenario B] The daily market demand for corporate logo designs is  $p = 150 - 0.15Q$  and the daily market supply is  $p = 30 + 0.09Q$ , where  $Q$  is the total logos and  $p$  is the price for a logo. An individual designer can produce logos with  $MC = 35 + 5q$ , where  $q$  is the quantity of logos designed every day. Find the equilibrium price in the market in scenario B.*

---

17. According to scenario B, how many logos will the designer produce per day to maximize profit?

- A. Around 4 logos.
- B. Around 8 logos.**
- C. Around 16 logos.
- D. Around 32 logos.
- E. Around 50 logos.
- F. Around 100 logos.

*[At the equilibrium, demand is equal to supply or  $150 - 0.15Q = 30 + 0.09Q$  or  $120 = 0.24Q$  or  $Q = 500$ . Therefore  $p = 150 - 0.15 \cdot 500 = 75$ . Therefore, the quantity produced by the individual designer will be set to the point at which  $p = MC$  or  $75 = 35 + 5q$  or  $5q = 40$  or  $q = 8$ ]*

18. How many designers could there be in the market from scenario B?

- A. Around 5.
- B. Around 10.
- C. Around 30.
- D. Around 60.**
- E. Around 100.
- F. Around 200.
- G. Around 500.

*[Since total quantity of the market is  $Q = 500$  and each designer's quantity is  $q = 8$ , the number of designers in the market will be  $N = Q/q$  or  $N = 500/8$  or  $N = 62.5$ ]*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

19. Because of inflationary pressures, the price of milk tends to increase. The government wants to prevent inflation; thus, it passes a law prohibiting any increase in the price of milk. Briefly explain what will happen in the market of milk in the short-run period. **[2 points penalty for exceeding 80 words]**

*If the price tends to go up but the government does not allow it to adjust, the situation will be equivalent to a price ceiling on a competitive market. A shortage is going to be created because quantity demanded will be higher and quantity supplied will be lower than that of the (new, wannabe) equilibrium price. [56 words]*

20. "Governments should stay out of running businesses. Just look around you, the government owns all true monopolies in the economy and they still manage to make losses in almost all of them!". Argue on the economic validity of the statement. **[2 points penalty for exceeding 80 words]**

*This statement is not economically valid, since monopolies owned by the government are usually natural monopolies. In these markets, losses are not due to the poor management, but a choice made by the government to maximize the use of the service. Thus, price will remain below AC and result to losses. [51 words]*

21. Provide one example of a positive externality followed by one example of a negative externality. **[2 points penalty for exceeding 80 words]**

*Positive externality arises from the owner of an apartment who cleans the communal corridor of his floor and his neighbors also enjoy its cleanliness. Accordingly, negative externality arises when a smoker enjoys the entire benefit of smoking a cigarette, but the second-hand smoke harms the others who are with him in the same room. [54 words]*

22. Explain why collusion is difficult in the car industry, where manufacturers have different profit objectives. **[2 points penalty for exceeding 80 words]**

*Some manufacturers aim to maximize their profits through sales, thus charging a higher profit margin per car. Others make their profits through after-sales services, thus charging a relative lower price per car, in order to maximize the number of cars they sell. Once they have different profit objectives it is difficult to agree on a price and collude. [58 words]*

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END OF TASKS

## Final Exam

Nov. 22, 2021

### Multiple Choice Tasks

Select the answer that most closely answers the question.

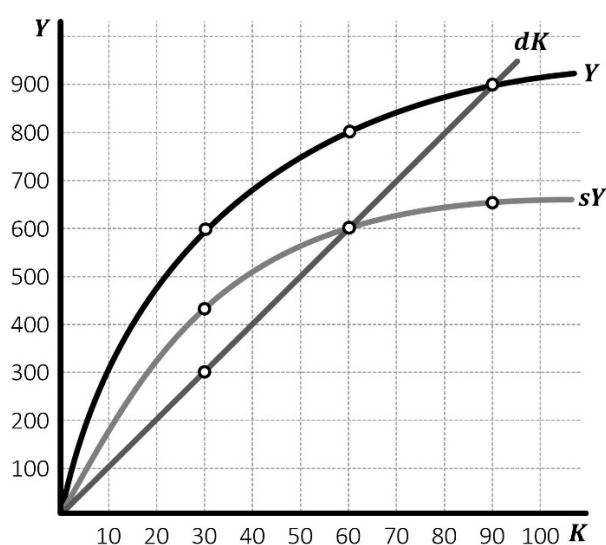
1. A citizen of Singapore takes a loan from a Malaysian bank and buys a house in Indonesia. Which of the following is true for the GNP of Singapore? [4pts]
  - A. It will increase.
  - B. It will decrease.
  - C. It will not be affected.
  - D. There is not enough information to tell.
2. While the economy of Rwanda already produces output at full capacity, a Chinese corporation offers 3 billion USD to companies in Rwanda to buy chemicals from them. Which of the following is most likely to happen in the S-R period? [4pts]
  - A. Rwanda's price level will tend to increase.
  - B. Rwanda's money supply will tend to increase.
  - C. Rwanda's output will tend to increase.
  - D. Rwanda's saving rate will tend to increase.
3. Which of the following is consistent with the Malthusian theory? [4pts]
  - A. Wealthy countries should have a higher population growth than poorer countries.
  - B. Poor countries should have a higher population growth than wealthier countries.
  - C. As population increases in a country, total GDP decreases.
  - D. As the price level increases in the country, population decreases.
4. Which of the following is an example for catch-up growth? [4pts]
  - A. A country develops its own line of traditional products and exports them.
  - B. A country invades an island from its neighboring country.
  - C. A country welcomes investment by foreign companies.
  - D. A country develops its own tourism industry and welcomes visitors from foreign countries.
  - E. All of the above.
5. Which of the following is a negative consequence of inflation? [4pts]
  - A. It decreases total investment by firms in the economy.
  - B. It decreases nominal GDP.
  - C. It creates menu costs.
  - D. It decreases money demand in the economy.

6. A lender expects inflation of 1% per year and loans out money for 3% per year. In the end of the year, inflation turned out to be 2%. Which of the following is accurate? [4pts]
- A. The lender was not affected by the unanticipated inflation.
  - B. The lender was hurt by the unanticipated inflation.
  - C. The lender benefited by the unanticipated inflation.
  - D. There is not enough information to tell.
7. Due to the discovery of a new vein of palladium mineral, the exports of a country increase. Which of the following is likely to be the result in the country's money market? [4pts]
- A. Inflation will increase.
  - B. Money demand will increase.
  - C. The interest rate will decrease.
  - D. Imports will increase.
8. Which of the following could be a good reason to decrease  $G$  in an economy? [4pts]
- A. To lower unemployment.
  - B. To stimulate economic growth.
  - C. To lower the interest rate.
  - D. To lower inflation.
9. A country's government decreases the taxation coefficient. Which of the following should the CB do in order to accommodate the policy? [4pts]
- A. Conduct Open Market Purchases.
  - B. Conduct Open Market Sales.
  - C. Issue new bonds.
  - D. Nothing.
10. Which of the following is illegal in Singapore? [4pts]
- A. When a firm charges prices below its competition.
  - B. When a firm charge prices above its MC.
  - C. When a firm becomes a Monopoly.
  - D. All of the above.
  - E. None of the above.
11. Which of the following firms will most likely want to advertise its product? [4pts]
- A. A Cournot Duopolist.
  - B. A Bertrand Duopolist.
  - C. A Monopolist with barriers to entry.
  - D. A Monopolistically Competitive firm.
  - E. A Perfectly Competitive firm.
  - F. A natural Monopolist.
12. Which of the following is the most likely scenario for a firm that earns zero profit? [4pts]
- A. The firm may want to exit the market in the L-R.
  - B. The firm may want to exit the market in the S-R.
  - C. The firm has no reason to exit the market at all.
  - D. The firm may want to wait and see if profit increases in the L-R and exit if it does not increase.
13. Who of the following is most likely to earn the highest profit? [4pts]

- A. A Cournot firm that has colluded with competitors.
- B. A Bertrand firm that has colluded with competitors.
- C. A monopolist.
- D. A regulated natural Monopoly.
- E. A Monopolistically competitive firm.

## Problem A

[Scenario A] An economy's long-run prospects are described by the curves in the figure. Use the Solow model to answer the following questions.



14. Consider the economy from scenario A. If the capital stock in this economy is 30 units, how much is the steady-state output? [4pts]
- A. Below 100 units.
  - B. Around 300 units.
  - C. Around 450 units.
  - D. Around 600 units.
  - E. Around 800 units.
  - F. Around 900 units.
15. Consider the economy from scenario A. If the capital stock in this economy is 30 units, which of the following is true for next year? [4pts]
- A. Output will grow.
  - B. Output will shrink.
  - C. Output will be the same as this year.
  - D. All of the above are possible.
16. According to scenario A, which of the following is most likely to indicate that this economy recently went through a crisis? [4pts]
- A. If current output is 300 units.
  - B. If current output is 500 units.
  - C. If current output is 800 units.
  - D. If current output is 900 units.

## Problem B

[Scenario B] A market faces demand

$$p = 150 - q$$

and supply

$$p = 0.5q.$$

17. Find the equilibrium price in the market in scenario B. [4pts]
- A. Price is around 20 dollars.
  - B. Price is around 30 dollars.
  - C. Price is around 40 dollars.
  - D. Price is around 50 dollars.**
  - E. Price is around 60 dollars.
  - F. Price is around 70 dollars.
  - G. Price is around 80 dollars.
  - H. Price is around 100 dollars.
18. Find the equilibrium price in the market in scenario B if the government imposes a 15-dollar tax to each unit sold. [4pts]
- A. Price is around 20 dollars.
  - B. Price is around 30 dollars.
  - C. Price is around 40 dollars.
  - D. Price is around 50 dollars.
  - E. Price is around 60 dollars.**
  - F. Price is around 65 dollars.
  - G. Price is around 90 dollars.
  - H. Price is around 115 dollars.

## Short Answer Tasks

Answer the following questions in no more than 80 words.

19. "Migrant workers reduce Singapore's GDP because they send the majority of their earnings back to their countries". Argue on the economic validity of this statement assuming that it is a fact that migrant workers send the majority of their earnings abroad. *[2 points penalty for exceeding 80 words]* [7pts]
20. Briefly explain what seigniorage is, who does it, and why. *[2 points penalty for exceeding 80 words]* [7pts]
21. In many countries, gas stations are obligated by law to post their prices of petrol on a sign near the entry, visible from the street, so that drivers can be informed for the price before they drive in the station. In Singapore, no such law exists. Briefly explain how this law would affect the prices and the profits of gas stations if it was implemented in Singapore. *[2 points penalty for exceeding 80 words]* [7pts]
22. In the 2019 movie "Triple Frontier" with Ben Affleck, a team of American operatives hunt down a drug lord in Colombia. After the drug lord is killed in the shootout, the operatives discover in his compound around 750M USD in cash. As they have no way to take all the money back to the US, they decide to set it on fire. Explain how this would affect the GDP of the United States and the GDP of Colombia. *[2 points penalty for exceeding 80 words]* [7pts]

## Final Exam - KEY

Nov. 22, 2021

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. A citizen of Singapore takes a loan from a Malaysian bank and buys a house in Indonesia. Which of the following is true for the GNP of Singapore? [4pts]
  - A. It will increase.
  - B. It will decrease.
  - C. It will not be affected.** *[Nothing is produced by a Singaporean entity in this scenario. The loan is not income, neither expenditure on Singaporean output]*
  - D. There is not enough information to tell.
2. While the economy of Rwanda already produces output at full capacity, a Chinese corporation offers 3 billion USD to companies in Rwanda to buy chemicals from them. Which of the following is most likely to happen in the S-R period? [4pts]
  - A. Rwanda's price level will tend to increase.** *[More money will enter the system with no increase in GDP, causing inflation]*
  - B. Rwanda's money supply will tend to increase. *[Nothing indicates this in the scenario]*
  - C. Rwanda's output will tend to increase. *[Output is already at full capacity]*
  - D. Rwanda's saving rate will tend to increase. *[Nothing indicates this in the scenario]*
3. Which of the following is consistent with the Malthusian theory? [4pts]
  - A. Wealthy countries should have a higher population growth than poorer countries.** *[According to Malthus, higher income causes increase in fertility rate]*
  - B. Poor countries should have a higher population growth than wealthier countries.
  - C. As population increases in a country, total GDP decreases.
  - D. As the price level increases in the country, population decreases.
4. Which of the following is an example for catch-up growth? [4pts]
  - A. A country develops its own line of traditional products and exports them. *[This is sustained growth]*
  - B. A country invades an island from its neighboring country. *[This may not even be growth]*
  - C. A country welcomes investment by foreign companies.** *[Textbook example of catch up growth]*
  - D. A country develops its own tourism industry and welcomes visitors from foreign countries. *[This is sustained growth]*
  - E. All of the above.
5. Which of the following is a negative consequence of inflation? [4pts]
  - A. It decreases total investment by firms in the economy. *[No, it does not]*
  - B. It decreases nominal GDP. *[The opposite is true]*
  - C. It creates menu costs.** *[Because people need to change prices often]*
  - D. It decreases money demand in the economy. *[The opposite is true]*

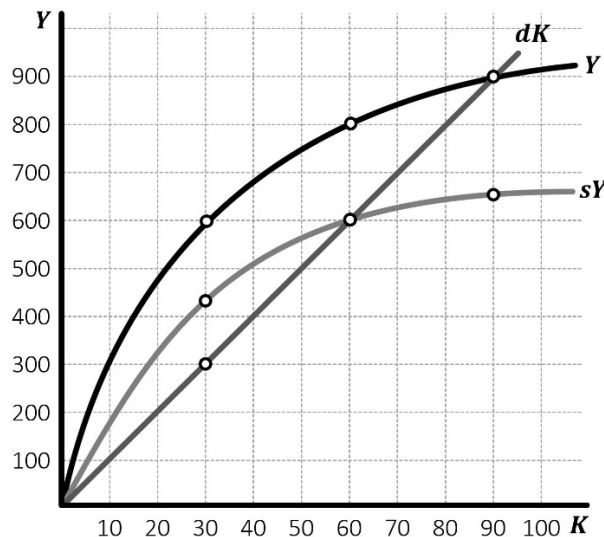
6. A lender expects inflation of 1% per year and loans out money for 3% per year. In the end of the year, inflation turned out to be 2%. Which of the following is accurate? [4pts]
- The lender was not affected by the unanticipated inflation.
  - The lender was hurt by the unanticipated inflation.** *[Because the lender lost to inflation part of her compensation for not being able to use her funds for the duration of the loan]*
  - The lender benefited by the unanticipated inflation.
  - There is not enough information to tell.
7. Due to the discovery of a new vein of palladium mineral, the exports of a country increase. Which of the following is likely to be the result in the country's money market? [4pts]
- Inflation will increase. *[Not if the creation of new money is held under control by the CB]*
  - Money demand will increase.** *[Foreigners will buy the palladium. Thus, they need to hold the exporting country's currency to pay for it]*
  - The interest rate will decrease. *[This will depend on the will of the CB]*
  - Imports will increase. *[Nothing in the scenario indicates this]*
8. Which of the following could be a good reason to decrease  $G$  in an economy? [4pts]
- To lower unemployment.
  - To stimulate economic growth.
  - To lower the interest rate.
  - To lower inflation.** *[As we explained in the lecture, contractionary policy primarily happens to lower inflation or to control the budget deficits]*
9. A country's government decreases the taxation coefficient. Which of the following should the CB do in order to accommodate the policy? [4pts]
- Conduct Open Market Purchases.** *[The decrease in  $t$  will cause  $Y$  to increase, which will cause money demand to increase. Open Market Purchases increase the money supply and counter balance the increase in money demand, preventing the interest rate from changing]*
  - Conduct Open Market Sales.
  - Issue new bonds.
  - Nothing.
10. Which of the following is illegal in Singapore? [4pts]
- When a firm charges prices below its competition. *[It can if it is not below its own cost]*
  - When a firm charge prices above its MC. *[It can if it has market power]*
  - When a firm becomes a Monopoly. *[It may if it has a superior product]*
  - All of the above.
  - None of the above.**
11. Which of the following firms will most likely want to advertise its product? [4pts]
- A Cournot Duopolist.
  - A Bertrand Duopolist.
  - A Monopolist with barriers to entry.
  - A Monopolistically Competitive firm.** *[It is the most likely to advertise because it's market power comes entirely from product differentiation, which can be stressed by advertisement]*
  - A Perfectly Competitive firm.
  - A natural Monopolist.



12. Which of the following is the most likely scenario for a firm that earns zero profit? [4pts]
- The firm may want to exit the market in the L-R.
  - The firm may want to exit the market in the S-R.
  - The firm has no reason to exit the market at all.** [Zero economic profit means that the best alternative for the owner is at best as good as running this firm]
  - The firm may want to wait and see if profit increases in the L-R and exit if it does not increase.
13. Who of the following is most likely to earn the highest profit? [4pts]
- A Cournot firm that has colluded with competitors. [Shares the monopoly profit with rivals]
  - A Bertrand firm that has colluded with competitors. [Shares the monopoly profit with rivals]
  - A monopolist.** [Does not share the market and can exploit the entire market demand]
  - A regulated natural Monopoly. [If it is regulated, its price will be set lower than that of the unregulated monopolist]
  - A Monopolistically competitive firm. [Does not exploit the entire market demand]

## Problem A

[Scenario A] An economy's long-run prospects are described by the curves in the figure. Use the Solow model to answer the following questions.



14. Consider the economy from scenario A. If the capital stock in this economy is 30 units, how much is the steady-state output? [4pts]
- Below 100 units.
  - Around 300 units.
  - Around 450 units.
  - Around 600 units.
  - Around 800 units.**
  - Around 900 units.
- [The steady-state is when  $dK = sY$ , which occurs at  $K = 60$  and  $Y = 800$ ]
15. Consider the economy from scenario A. If the capital stock in this economy is 30 units, which of the following is true for next year? [4pts]
- Output will grow.**

- B. Output will shrink.
- C. Output will be the same as this year.
- D. All of the above are possible.

*[When  $K = 30$ ,  $sY > dK$ , thus more  $K$  will exist next year and therefore  $Y$  will grow]*

16. According to scenario A, which of the following is most likely to indicate that this economy recently went through a crisis? [4pts]

- A. If current output is 300 units.
- B. If current output is 500 units.
- C. If current output is 800 units.
- D. If current output is 900 units.**

*[A crisis will be indicated from the fact that current  $Y$  exceeds the steady-state  $Y$ , meaning that the economy adjusts downwards. This is the case when  $Y > 800$ ]*

## Problem B

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*[Scenario B] A market faces demand*

$$p = 150 - q$$

*and supply*

$$p = 0.5q.$$


---

17. Find the equilibrium price in the market in scenario B. [4pts]

- A. Price is around 20 dollars.
- B. Price is around 30 dollars.
- C. Price is around 40 dollars.
- D. Price is around 50 dollars.**
- E. Price is around 60 dollars.
- F. Price is around 70 dollars.
- G. Price is around 80 dollars.
- H. Price is around 100 dollars.

*[It should be  $150 - q = 0.5q$  or  $1.5q = 150$  or  $q = 100$ . Thus, from supply  $p = 0.5 \cdot 100$  or  $p = 50$ ]*

18. Find the equilibrium price in the market in scenario B if the government imposes a 15-dollar tax to each unit sold. [4pts]

- A. Price is around 20 dollars.
- B. Price is around 30 dollars.
- C. Price is around 40 dollars.
- D. Price is around 50 dollars.
- E. Price is around 60 dollars.**
- F. Price is around 65 dollars.
- G. Price is around 90 dollars.
- H. Price is around 115 dollars.

*[Taxation will affect the supply curve by raising it by 15 dollars. That is, supply with the tax is  $p = 15 + 0.5q$ . So  $150 + q = 15 + 0.5q$  or  $1.5q = 135$  or  $q = 90$ . From the supply curve,  $p = 15 + 0.5 \cdot 90$  or  $p = 60$ ]*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

19. "Migrant workers reduce Singapore's GDP because they send the majority of their earnings back to their countries". Argue on the economic validity of this statement assuming that it is a fact that migrant workers send the majority of their earnings abroad. *[2 points penalty for exceeding 80 words]* [7pts]

*The statement is fundamentally wrong. Migrant workers increase Singapore's GDP because they produce output in Singapore. The fact that they send income abroad instead of spending it in Singapore, decreases only the multiplicative effect which would further increase Singapore's GDP. So, migrant workers increase Singapore's GDP, just a bit less than local workers would. [54 words]*

20. Briefly explain what seigniorage is, who does it, and why. *[2 points penalty for exceeding 80 words]* [7pts]

*Seigniorage is when the government asks for newly printed money by the CB in order to fund fiscal policy or pay back debt. Seigniorage is also an 'inflation tax', because the circulation of new money lags behind GDP growth causing increase in prices, which subtracts purchasing power from M1 money holders and transfers it to the government. [57 words]*

21. In many countries, gas stations are obligated by law to post their prices of petrol on a sign near the entry, visible from the street, so that drivers can be informed for the price before they drive in the station. In Singapore, no such law exists. Briefly explain how this law would affect the prices and the profits of gas stations if it was implemented in Singapore. *[2 points penalty for exceeding 80 words]* [7pts]

*Customers will have better information and would likely choose the cheaper option since fuel is generally homogeneous. Demand will become more elastic and setting a price above competition would cause loss of significant market share, leading to Bertrand competition via undercutting of prices. Eventually, the market will reach the Bertrand paradox with prices dropping near MC and economic profits will vanish. [61 words]*

22. In the 2019 movie "Triple Frontier" with Ben Affleck, a team of American operatives hunt down a drug lord in Colombia. After the drug lord is killed in the shootout, the operatives discover in his compound around 750M USD in cash. As they have no way to take all the money back to the US, they decide to set it on fire. Explain how this would affect the GDP of the United States and the GDP of Colombia. *[2 points penalty for exceeding 80 words]* [7pts]

*GDP is the measure of the total value of all goods and services produced by a country's residents within its borders in a given year. GDP does not include cash. Since only cash is burned in the scenario, there is no change in the value of goods and services produced by either country. The GDP of neither country will be affected. [61 words]*

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END OF EXAM

## Midterm Test

Oct. 1, 2021

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. A PC market has a downward sloping demand and an upward sloping supply. Which of the following is the most likely to cause a DWL? [4pts]
  - A. An increase in demand because the product becomes more desirable among consumers.
  - B. A decrease in demand because of newly imposed health restrictions in the consumption of this good.
  - C. An increase in supply because of the invention of a new technology.
  - D. A decrease in supply because of shortage in raw materials.
  - E. None of the above.
2. Which of the following is the most likely to cause a shift in the supply of a PC good? [4pts]
  - A. An increase in rent.
  - B. An increase in the cost of labor.
  - C. An increase in the demand of the good.
  - D. An increase in the price of the good.
3. A market consists of 5 firms which sell slightly differentiated products but all charge the same price. When a firm increases its production, the other firms do not respond. Which of the following models would be the most suitable to explain this market? [4pts]
  - A. Perfect Competition.
  - B. Monopolistic Competition.
  - C. Cournot Oligopoly.
  - D. Bertrand Oligopoly
  - E. Monopoly.
  - F. Kinked-demand model.
4. Which of the following is / are accurate? [4pts]
  - A. If a firm has profit, it must also have market power.
  - B. If a firm has market power, it must also have profit.
  - C. Both of the above are accurate.
  - D. None of the above is accurate.
5. Neeta used to work as an assistant accountant making 3,000 dollars per month. After she quit her job, she started producing tik-tok videos. She leases the equipment for 1,000 dollars per month and she earns 3,500 dollars per month revenue from ads and sponsorship deals. How much is Neeta's economic profit from doing tik-tok? [4pts]
  - A. Around 3,500 dollars.
  - B. Around 3,000 dollars.

- C. Around 2,500 dollars.
  - D. Around 1,000 dollars.
  - E. Around 500 dollars.
  - F. Around 0 dollars.
  - G. Around -500 dollars.
  - H. Around -1,000 dollars.
6. Which of the following may be a reason why two Bertrand competitors may end up earning profit? [4pts]
- A. Because both have the capacity to supply the entire market each on their own.
  - B. Because when a competitor cuts the price, the other does not know it.
  - C. Because their products are indistinguishably identical.
  - D. None of the above.
7. An industry currently has 9 firms. Which of the following may cause this industry to become a natural monopoly? [4pts]
- A. When by merging two or more firms leads to a lower cost per unit.
  - B. When government legislates barriers to entry.
  - C. When demand keeps increasing.
  - D. When firms are willing to collude.
  - E. All of the above.
8. Which of the following is the least compatible with a PC market? [4pts]
- A. Economies of Scale.
  - B. Positive long-run profits.
  - C. Decrease in number of firms.
  - D. Constant cost per unit.
9. Which of the following may indicate that a market exhibits a kinked-demand behavior? [4pts]
- A. Firms tend to decrease their prices over time.
  - B. Firms increase their prices in a coordinated manner.
  - C. Prices are kept high even when MC decreases.
  - D. Prices in this industry tend to go up and down unexpectedly.
10. Which of the following firms is possible to have an inelastic supply curve? [4pts]
- A. A PC firm.
  - B. A Monopoly.
  - C. Both of the above.
  - D. None of the above.
11. If the marginal cost is constant and positive, which of the following must also be constant and positive? [4pts]
- A. The total cost.
  - B. The average variable cost.
  - C. The fixed cost.
  - D. The marginal revenue.
12. In which of the following instances a tax imposed by the government may decrease the DWL? [4pts]
- A. When it is imposed on a monopoly.
  - B. When it is imposed on a PC market.

- C. When it is imposed on a market that produces a negative externality.
- D. All of the above.

13. Which of the following personal expenses most closely resembles a sunk cost? [4pts]

- A. A Netflix subscription.
- B. Breast implants.
- C. The purchase of an investment property.
- D. Groceries.

## Problem A

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*[Scenario A] The market demand is  $p = 230 - 4Q$ , where  $p$  is the price and  $Q$  is the total quantity available for sale. The marginal cost of production for the good is  $20 + 2Q$  (no matter who produces it).*

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- 14. What is the monopoly price in the market of scenario A? [3pts]
- 15. What is the Cournot Oligopoly price in the market of scenario A? [3pts]
- 16. If the market in scenario A was a monopoly and a regulator wished to make the monopolist produce the maximum possible quantity, what price ceiling would the regulator impose? [3pts]
- 17. If the market in scenario A was a monopoly, how much would the DWL be? [3pts]

## Problem B

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*[Scenario B] The following list shows how much each individual is willing to pay for a Bubble-tea at the local store:*

*Alan: 6 dollars.*

*Billie: 5 dollars.*

*Caleb: 9 dollars.*

*Daisy: 9 dollars.*

*Esther: 8 dollars.*

*Fred: 5 dollars.*

*Gregory: 8 dollars.*

*Heather: 7 dollars.*

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- 18. According to scenario B, how much is the marginal revenue for the store from selling the fifth cup of bubble tea? [4pts]
- 19. If the store from scenario B prices bubble-tea at 7 dollars per cup, how much is the total consumer surplus in the market? [4pts]

## Short Answer Tasks

Answer the following questions in no more than 80 words.

- 20. "Sexual acts are legal between adults. Selling stuff is legal among adults. Thus, adults selling sex to adults (prostitution) should be legal." Is this argument economically accurate or a logical fallacy? *[2 points penalty for exceeding 80 words]* [7pts]

21. People who become addicted to gambling, reach levels of suffering that often compare to those of drug, alcohol or smoking addicted individuals. Thus, undoubtedly, gambling is a societal problem. Is gambling a market failure, as well? Explain why or why not. *[2 points penalty for exceeding 80 words]* [7pts]
22. Explain why a country's response to Covid-19 can be a strategic issue. *[2 points penalty for exceeding 80 words]* [7pts]
23. Explain how is it possible that an individual is able to make a living from running a business while the economic profit of the business is constantly negative. *[2 points penalty for exceeding 80 words]* [7pts]

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END OF TEST

## Midterm Test – KEY

Oct. 1, 2021

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. A PC market has a downward sloping demand and an upward sloping supply. Which of the following is the most likely to cause a DWL? [4pts]
  - A. An increase in demand because the product becomes more desirable among consumers.
  - B. A decrease in demand because of newly imposed health restrictions in the consumption of this good.
  - C. An increase in supply because of the invention of a new technology.
  - D. A decrease in supply because of shortage in raw materials.
  - E. None of the above.**  
*[A shift either in demand or in supply will simply move the market to a new PC equilibrium at which  $p = MC$  and thus no DWL will be created]*
2. Which of the following is the most likely to cause a shift in the supply of a PC good? [4pts]
  - A. An increase in rent. *[This will usually be a fixed cost, does not affect the MC]*
  - B. An increase in the cost of labor.** *[Labor is here the most variable factor, so it will affect the MC and thus the supply of the PC good]*
  - C. An increase in the demand of the good. *[The demand curve does not affect the supply curve]*
  - D. An increase in the price of the good. *[A change in own price does not affect the demand, only the quantity demanded]*
3. A market consists of 5 firms which sell slightly differentiated products but all charge the same price. When a firm increases its production, the other firms do not respond. Which of the following models would be the most suitable to explain this market? [4pts]
  - A. Perfect Competition. *[Firms are not that many]*
  - B. Monopolistic Competition.**
  - C. Cournot Oligopoly. *[Firms would respond to changes of quantity]*
  - D. Bertrand Oligopoly *[Firms compete with price in Bertrand]*
  - E. Monopoly. *[There are 5 firms]*
  - F. Kinked-demand model. *[Firms would respond to increase in quantity which would cause decrease in price]*
4. Which of the following is / are accurate? [4pts]
  - A. If a firm has profit, it must also have market power. *[A PC firm may have profit in the S-R, yet  $p = MC$ , so has zero market power]*
  - B. If a firm has market power, it must also have profit. *[We saw examples in the lecture (iPad toilet case etc.) where the product is monopolistic but due to elastic demand, the seller has no profit]*
  - C. Both of the above are accurate.
  - D. None of the above is accurate.**



5. Neeta used to work as an assistant accountant making 3,000 dollars per month. After she quit her job, she started producing tik-tok videos. She leases the equipment for 1,000 dollars per month and she earns 3,500 dollars per month revenue from ads and sponsorship deals. How much is Neeta's economic profit from doing tik-tok? [4pts]
- A. Around 3,500 dollars.
  - B. Around 3,000 dollars.
  - C. Around 2,500 dollars.
  - D. Around 1,000 dollars.
  - E. Around 500 dollars.
  - F. Around 0 dollars.
  - G. Around -500 dollars.**
  - H. Around -1,000 dollars.
- [Her accounting profit is  $3,500 - 1,000 = 2,500$ . Her opportunity cost is 3,000. Her economic profit is  $2,500 - 3,000 = -500$ ]*
6. Which of the following may be a reason why two Bertrand competitors may end up earning profit? [4pts]
- A. Because both have the capacity to supply the entire market each on their own. *[This would point to the direction of the Bertrand paradox of zero profit because increases the incentive to undercut]*
  - B. Because when a competitor cuts the price, the other does not know it. *[This also increases the incentive to undercut pointing towards zero profit]*
  - C. Because their products are indistinguishably identical. *[When products are homogeneous, consumers see no difference, thus price is the only decisive factor for sale, thus the incentive to undercut is intensified]*
  - D. None of the above.**
7. An industry currently has 9 firms. Which of the following may cause this industry to become a natural monopoly? [4pts]
- A. When by merging two or more firms leads to a lower cost per unit.** *[This points to the direction that AC is decreasing which could be a reason for natural monopoly]*
  - B. When government legislates barriers to entry. *[This will prevent new entrants but will not kick out the existent]*
  - C. When demand keeps increasing. *[This will typically invite entrants]*
  - D. When firms are willing to collude. *[This could happen to any oligopoly]*
  - E. All of the above.
8. Which of the following is the least compatible with a PC market? [4pts]
- A. Economies of Scale. *[EoS is a characteristic of production. Can occur in any market structure]*
  - B. Positive long-run profits.** *[Not in PC]*
  - C. Decrease in number of firms. *[Can happen in the L-R if the PC firms run losses]*
  - D. Constant cost per unit. *[This is also a characteristic of production and can happen in any market]*
9. Which of the following may indicate that a market exhibits a kinked-demand behavior? [4pts]
- A. Firms tend to decrease their prices over time. *[This may be a result of some shock but not a characteristic of a specific model]*
  - B. Firms increase their prices in a coordinated manner. *[This simply points to collusion]*
  - C. Prices are kept high even when MC decreases.** *[This is one of the key implications of kinked demand]*

- D. Prices in this industry tend to go up and down unexpectedly. *[In kinked demand we observe the opposite: price stability around the prevailing price]*
10. Which of the following firms is possible to have an inelastic supply curve? [4pts]
- A PC firm.
  - A Monopoly. *[Does not have a supply curve]*
  - Both of the above.
  - None of the above.
11. If the marginal cost is constant and positive, which of the following must also be constant and positive? [4pts]
- The total cost. *[If MC is positive, additional production increases the TC]*
  - The average variable cost.** *[If the cost of each extra unit is constant, the average cost of all units must be constant, too]*
  - The fixed cost. *[The fixed cost is not affected by MC]*
  - The marginal revenue. *[MR is affected by the demand, not cost]*
12. In which of the following instances a tax imposed by the government may decrease the DWL? [4pts]
- When it is imposed on a monopoly. *[It will increase the DWL]*
  - When it is imposed on a PC market. *[It will increase the DWL]*
  - When it is imposed on a market that produces a negative externality.** *[As explained in tutorial video 6]*
  - All of the above.
13. Which of the following personal expenses most closely resembles a sunk cost? [4pts]
- A Netflix subscription. *[It is an avoidable cost in the sense that you may stop it when you do not want it anymore]*
  - Breast implants.** *[Once you incur the cost you cannot recover it by reselling it or repurposing it – you will never see an add on Carousel: “Guess what I am selling second-hand”]*
  - The purchase of an investment property. *[It is supposed to maintain its resale value even after a long time]*
  - Groceries. *[You can recover their cost by reselling them, much easier than breast implants]*

## Problem A

*[Scenario A] The market demand is  $p = 230 - 4Q$ , where  $p$  is the price and  $Q$  is the total quantity available for sale. The marginal cost of production for the good is  $20 + 2Q$  (no matter who produces it).*

14. What is the monopoly price in the market of scenario A? [3pts]

*The marginal revenue is  $MR = 230 - 8Q$ . Then,  $MR = MC$  or  $230 - 8Q = 20 + 2Q$  or  $10Q = 210$  or  $Q = 21$ . From the demand:  $p = 230 - 4 \cdot Q = 230 - 4 \cdot 21 = 146$ .*

15. What is the Cournot Oligopoly price in the market of scenario A? [3pts]

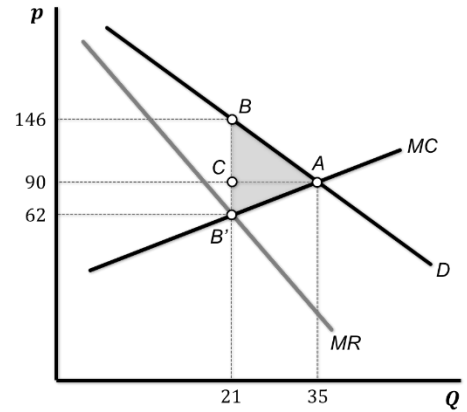
*The Cournot oligopoly will have demand  $p = 230 - 4q_1 - 4q_2$ . For firm 1:  $MR_1 = 230 - 8q_1 - 4q_2$ . Then,  $MR_1 = MC$  or  $230 - 8q_1 - 4q_2 = 20 + 2q_1$ . We know that  $q_1 = q_2$ , thus  $230 - 8q_1 - 4q_1 = 20 + 2q_1$  or  $14q_1 = 210$  or  $q_1 = 15$ , which means that  $q_2 = 15$  and  $Q = 30$ . From the demand:  $p = 230 - 4 \cdot Q = 230 - 4 \cdot 30 = 110$ .*

16. If the market in scenario A was a monopoly and a regulator wished to make the monopolist produce the maximum possible quantity, what price ceiling would the regulator impose? [3pts]

The maximum quantity will be sold when the PC price is set. This is when the demand crosses the MC. That is,  $p = MC$  or  $230 - 4Q = 20 + 2Q$  or  $6Q = 210$  or  $Q = 35$ . From the demand:  $p = 230 - 4 \cdot Q = 230 - 4 \cdot 35 = 90$ .

17. If the market in scenario A was a monopoly, how much would the DWL be? [3pts]

We need to calculate the area of the triangle  $ABB'$ . It is easier if we use  $BB'$  as base which is  $146 - 62 = 84$ , and  $CA$  as height which is  $35 - 21 = 14$ . Thus, the area will be  $84 \cdot 14 \cdot 0.5 = 588$ .



## Problem B

[Scenario B] The following list shows how much each individual is willing to pay for a Bubble-tea at the local store:

Alan: 6 dollars.

Billie: 5 dollars.

Caleb: 9 dollars.

Daisy: 9 dollars.

Esther: 8 dollars.

Fred: 5 dollars.

Gregory: 8 dollars.

Heather: 7 dollars.

18. According to scenario B, how much is the marginal revenue for the store from selling the fifth cup of bubble tea? [4pts]

In order to come up with the MR for the fifth unit, we must calculate the revenue for the 4th and for the 5th unit. Let us start with calculating the demand ( $p$  vs.  $Q$ ) from the data we have. If the price is 9, only Caleb and Daisy buy, thus  $Q = 2$ . If the price falls to 8, Esther and Gregory buy too, thus  $Q = 4$ . If the price falls to 7, Heather buys, so  $Q = 5$ . With price down to 6, Alan joins, thus  $Q = 6$ . And finally, when price becomes 5, Billie and Fred buy as well, so  $Q = 8$ . This can be summarized in the table.

$P$	5	6	7	8	9
$Q$	8	6	5	4	2

When quantity is 4, revenue is  $4 \cdot 8 = 32$ . When quantity is 5, revenue is  $5 \cdot 7 = 35$ . Thus, marginal revenue from the fourth to the fifth unit is  $35 - 32 = 3$  dollars.

19. If the store from scenario B prices bubble-tea at 7 dollars per cup, how much is the total consumer surplus in the market? [4pts]

If the price is 7 dollars, only Caleb, Daisy, Esther, Gregory and Heather will buy. Caleb is willing to pay 9 and pays 7, so his CS = 2. Daisy the same, so her CS = 2. Esther is willing to pay 8 and pays 7, so her CS = 1.

Gregory also has  $CS = 1$ . Heather is willing to pay 7 and pays 7, thus her  $CS = 0$ . The total  $CS$  is  $2 + 2 + 1 + 1 + 0 = 6$  dollars.

## Short Answer Tasks

Answer the following questions in no more than 80 words.

20. "Sexual acts are legal between adults. Selling stuff is legal among adults. Thus, adults selling sex to adults (prostitution) should be legal." Is this argument economically accurate or a logical fallacy? *[2 points penalty for exceeding 80 words]* [7pts]

*The statement considers two individual true facts and concludes that their combination should also be true. The argument is not economically sound because according to the fallacy of composition: what is true for the unit, is not necessarily true for the whole [42 words]*

21. People who become addicted to gambling, reach levels of suffering that often compare to those of drug, alcohol or smoking addicted individuals. Thus, undoubtedly, gambling is a societal problem. Is gambling a market failure, as well? Explain why or why not. *[2 points penalty for exceeding 80 words]* [7pts]

*Gambling can be a market failure of the type: "Consumers may fail to evaluate the consequences of the use of a product". That is, one consumes the quantity that deems optimal now, without being able to take into account the long-term effects of this decision. [45 words]*

22. Explain why a country's response to Covid-19 can be a strategic issue. *[2 points penalty for exceeding 80 words]* [7pts]

*Because the domestic cost of the decision to open may depend on how other countries respond to the pandemic by closing or opening their borders. [25 words]*

23. Explain how is it possible that an individual is able to make a living from running a business while the economic profit of the business is constantly negative. *[2 points penalty for exceeding 80 words]* [7pts]

*This could be due to the opportunity cost of labor or capital. If this individual's opportunity cost from those two exceeds their accounting profit of the business, economic profit will be negative. Nevertheless, this individual will still be able to take home the accounting profit and if the latter is positive, they will be able to make a living. [59 words]*

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END OF TEST

## Final EXAM

Apr. 19, 2021

### Multiple Choice Tasks

Select the answer that most closely answers the question.

- Which of the following transactions will affect the country's GDP for the current year? [4pts]
  - The sale of a 2013 VW Golf by a domestic used car dealership.
  - The sale of consulting services by a domestic firm to an overseas client.
  - The renovation of a house which is located within the country.
  - All of the above.
  - None of the above.
- Which of the following countries is most likely to exhibit a GDP that exceeds the GNP? [4pts]
  - A country where imports exceed exports.
  - A country where exports exceed imports.
  - A country where the number of foreigners who live there exceeds the number of its citizens who have migrated to other countries.
  - A country where the number of its citizens who have migrated to other countries exceeds the number of foreigners who live there.
  - GDP cannot exceed GNP.
- A country's GDP growth rate for 2020 was found to be -0.5%. Which of the following is accurate? [4pts]
  - The GDP of the country is 0.5% less than the world average.
  - The GDP of the country grew 0.5% less than the world average.
  - The GDP of the country is 0.5% less than what it was last year.
  - The GDP of the country grew 0.5% less than what it grew last year.
- Which of the following could have broken the Malthusian cycle if it had happened 2 centuries before the Industrial Revolution? [4pts]
  - The invention of the contraceptive pill.
  - The invention of antibiotics.
  - Both of the above.
  - None of the above.
- Which of the following will shift the Money Demand curve towards the right (increase money demand)? [4pts]
  - An increase in the marginal propensity of consumption.
  - A decrease in investment.
  - Both of the above.
  - None of the above.
- The official reserve ratio requirement for commercial banks is 20%. However, because the discount rate is set to 50%, commercial banks reserve an additional 5% of total deposits on top of the reserve requirement

for security reasons. How many total dollars will be generated within the banking system from a 100-dollar deposit? [4pts]

- A. Around 0 dollars.
- B. Around 100 dollars.
- C. Around 250 dollars.
- D. Around 400 dollars.
- E. Around 500 dollars.
- F. Around 1,000 dollars.

7. Due to fear from the expectation of high inflation, the citizens of a country try to store value in intrinsic value assets such as gold, silver, real estate and collectibles, instead of holding money. In order to reverse this trend, the Central Bank credibly promises to keep the quantity of money constant for the next 2 years. Which of the following may be a problem from such a promise? [4pts]

- A. Inflation may rise even more.
- B. The Central Bank may not be able to control the interest rate.
- C. Stagflation may occur.
- D. Consumption may decrease.

8. Which of the following would be the most likely advantage of conducting expansionary fiscal policy through decreasing the tax coefficient? [4pts]

- A. Households will be able to consume more.
- B. No budget deficit will result from this policy.
- C. Income redistribution from this policy will be more extensive.
- D. All of the above.

9. Which of the following chain of results could be valid? [4pts]

- A. Decrease in exports causes an increase in output, which causes an increase in money demand.
- B. Increase in investment causes an increase in output, which causes an increase in money demand.
- C. Both of the above.
- D. None of the above.

10. The government of a country decides to permanently increase the work-week by 8 hours. As a result, firms now need a lower number of workers. Which of the following is possible? [4pts]

- A. Structural unemployment will increase.
- B. The natural rate of unemployment will increase.
- C. Both of the above are possible.
- D. None of the above is possible.

11. Which of the following markets may NOT have a zero L-R profit? [4pts]

- A. PC market, monopoly, monopolistic competition, Bertrand duopoly, Cournot duopoly.
- B. Monopoly, monopolistic competition, Bertrand duopoly, Cournot duopoly.
- C. Monopoly, monopolistic competition, Cournot duopoly.
- D. Monopoly, Cournot duopoly.

12. Which of the following may be a resolution of the Bertrand paradox? [4pts]

- A. The competitors interact for only one instance and then they never meet each-other again.
- B. Every competitor has the productive ability to cover the entire market on their own.
- C. All competitors sell identical products.

- D. All competitors together have agreed and prepaid a contract assassin who is directed to execute whoever of them cuts the price first.
  - E. None of the above.
13. A government regulator wants to ensure that the metropolitan railway operates at maximum economic efficiency. Which of the following methods of pricing should the regulator follow? [4pts]
- A. A price floor at  $p = MC$ .
  - B. A price floor at the price for which  $MR = MC$ .
  - C. A price floor at  $p = AC$ .
  - D. A price ceiling at  $p = MC$ .
  - E. A price ceiling at the price for which  $MR = MC$ .
  - F. A price ceiling at  $p = AC$ .

### Problem A

*[Scenario A] If France dedicates its entire production capacity to producing croissants it can produce 200 units; if it dedicates it to the production of espresso, it can produce 100 units.*

*If Italy dedicates its entire production capacity to producing croissants it can produce 120 units; if it dedicates it to the production of espresso, it can produce 80 units.*

- 14. According to scenario A, which country has the absolute advantage in the production of croissants? [2pts]
- 15. According to scenario A, which country has the absolute advantage in the production of espresso? [2pts]
- 16. According to scenario A, which country has the comparative advantage in the production of croissants? [2pts]
- 17. According to scenario A, which country has the comparative advantage in the production of espresso? [2pts]
- 18. According to scenario A, how many units of croissants would France be willing to offer for 1 unit of Italian espresso? [2pts]
- 19. According to scenario A, how many units of croissants would Italy be willing to offer for 1 unit of French espresso? [2pts]

### Problem B

*[Scenario B] A market faces demand  $p = 90 - 2q$ . The marginal cost is given by  $MC = q$ .*

- 20. Find the equilibrium price if the market in scenario B is perfectly competitive. [2pts]
- 21. Find the equilibrium price if the market in scenario B is a monopoly. [3pts]
- 22. How much is the DWL, if the market in scenario B is a monopoly? [3pts]

## Short Answer Tasks

Answer the following questions in no more than 80 words.

23. Consider the Solow model as it was developed in class. Assume that an economist had graphed the exact  $Y$ ,  $sY$ ,  $dK$  curves and had precisely calculated the steady-state GDP for Italy in June, 2019 before Covid-19 affects the country. In March, 2020 the virus hit Italy severely taking around 120,000 lives. Explain/describe what changes you would make to the Solow graph to update it regarding the impact of the virus on the economy. *[2 points penalty for exceeding 80 words]* [7pts]
24. A few months ago, the FED (the Central Bank of the US), increased the money supply in the economy by almost 4.5%. Contrary to expectations, inflation was measured by the US Statistics Bureau to be only 0.3%. What could possibly explain the paradox that the increase in money supply did not cause high inflation? *[2 points penalty for exceeding 80 words]* [7pts]
25. Define what the Phillips relationship is and briefly explain why and when it holds. *[2 points penalty for exceeding 80 words]* [7pts]
26. Briefly describe a real-world situation or an example of a market failure, where the price of a good or service fails to reflect its cost to society. [Hint: no definitions are required – just mention what the situation / example is and why it qualifies as such] *[2 points penalty for exceeding 80 words]* [7pts]

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END OF EXAM



## Final EXAM – KEY

Apr. 19, 2021

### Multiple Choice Tasks

Select the answer that most closely answers the question.

- Which of the following transactions will affect the country's GDP for the current year? [4pts]
  - The sale of a 2013 VW Golf by a domestic used car dealership. *[The value of the car will not be included; the value of the service offered by the dealership will be included]*
  - The sale of consulting services by a domestic firm to an overseas client. *[This is GDP that is exported]*
  - The renovation of a house which is located within the country. *[This is part of GDP]*
  - All of the above.**
  - None of the above.
- Which of the following countries is most likely to exhibit a GDP that exceeds the GNP? [4pts]
  - A country where imports exceed exports.
  - A country where exports exceed imports.
  - A country where the number of foreigners who live there exceeds the number of its citizens who have migrated to other countries.**
  - A country where the number of its citizens who have migrated to other countries exceeds the number of foreigners who live there.
  - GDP cannot exceed GNP.

*[For GDP to exceed GNP, we should have that production of residents should exceed production of citizens]*
- A country's GDP growth rate for 2020 was found to be -0.5%. Which of the following is accurate? [4pts]
  - The GDP of the country is 0.5% less than the world average.
  - The GDP of the country grew 0.5% less than the world average.
  - The GDP of the country is 0.5% less than what it was last year. *[From the definition of GDP]***
  - The GDP of the country grew 0.5% less than what it grew last year.
- Which of the following could have broken the Malthusian cycle if it had happened 2 centuries before the Industrial Revolution? [4pts]
  - The invention of the contraceptive pill.
  - The invention of antibiotics.
  - Both of the above.
  - None of the above.**

*[The Malthusian cycle was that prosperity caused births. This was not because people could not control having children, neither because of high mortality; it was because people wanted it as larger families were also stronger families]*

5. Which of the following will shift the Money Demand curve towards the right (increase money demand)? [4pts]
- An increase in the marginal propensity of consumption.** *[Consumption increases money demand]*
  - A decrease in investment. *[This should decrease money demand]*
  - Both of the above.
  - None of the above.
6. The official reserve ratio requirement for commercial banks is 20%. However, because the discount rate is set to 50%, commercial banks reserve an additional 5% of total deposits on top of the reserve requirement for security reasons. How many total dollars will be generated within the banking system from a 100-dollar deposit? [4pts]
- Around 0 dollars.
  - Around 100 dollars.
  - Around 250 dollars.
  - Around 400 dollars.**
  - Around 500 dollars.
  - Around 1,000 dollars.
- [The actual/effective RR is  $0.2 + 0.05 = 0.25$ . Thus, the MM = 4]*
7. Due to fear from the expectation of high inflation, the citizens of a country try to store value in intrinsic value assets such as gold, silver, real estate and collectibles, instead of holding money. In order to reverse this trend, the Central Bank credibly promises to keep the quantity of money constant for the next 2 years. Which of the following may be a problem from such a promise? [4pts]
- Inflation may rise even more. *[This will not occur unless GDP decreases]*
  - The Central Bank may not be able to control the interest rate.** *[If money supply cannot be moved, the CB cannot control the interest rate]*
  - Stagflation may occur. *[This will not occur unless GDP decreases and unemployment increases]*
  - Consumption may decrease. *[This cannot be a direct result of not changing money supply]*
8. Which of the following would be the most likely advantage of conducting expansionary fiscal policy through decreasing the tax coefficient? [4pts]
- Households will be able to consume more.** *[Because C is affected by the after-tax income]*
  - No budget deficit will result from this policy. *[The opposite is true]*
  - Income redistribution from this policy will be more extensive. *[The opposite is true]*
  - All of the above.
9. Which of the following chain of results could be valid? [4pts]
- Decrease in exports causes an increase in output, which causes an increase in money demand. *[Decrease in exports does not cause an increase in output]*
  - Increase in investment causes an increase in output, which causes an increase in money demand.** *[This is link 1]*
  - Both of the above.
  - None of the above.
10. The government of a country decides to permanently increase the work-week by 8 hours. As a result, firms now need a lower number of workers. Which of the following is possible? [4pts]
- Structural unemployment will increase.
  - The natural rate of unemployment will increase.
  - Both of the above are possible.**

D. None of the above is possible.

*[This is a structural change in the economy and it is also permanent. It will increase structural unemployment and will also increase the long-run average unemployment (natural rate) in the economy]*

11. Which of the following markets may NOT have a zero L-R profit? [4pts]

- A. PC market, monopoly, monopolistic competition, Bertrand duopoly, Cournot duopoly.
- B. Monopoly, monopolistic competition, Bertrand duopoly, Cournot duopoly.
- C. Monopoly, monopolistic competition, Cournot duopoly.
- D. Monopoly, Cournot duopoly.**

*[Monopolistic competition, PC market and Bertrand duopoly will or may have zero L-R profit]*

12. Which of the following may be a resolution of the Bertrand paradox? [4pts]

- A. The competitors interact for only one instance and then they never meet each-other again. *[The opposite would resolve the paradox]*
- B. Every competitor has the productive ability to cover the entire market on their own. *[The opposite would resolve the paradox]*
- C. All competitors sell identical products. *[The opposite would resolve the paradox]*
- D. All competitors together have agreed and prepaid a contract assassin who is directed to execute whoever of them cuts the price first.** *[This would completely eliminate the incentive to cheat and would resolve the paradox. This was the job of the "Godfather" in mafia, which was a Bertrand oligopoly in terms of market organization]*
- E. None of the above.

13. A government regulator wants to ensure that the metropolitan railway operates at maximum economic efficiency. Which of the following methods of pricing should the regulator follow? [4pts]

- A. A price floor at  $p = MC$ .
- B. A price floor at the price for which  $MR = MC$ .
- C. A price floor at  $p = AC$ .
- D. A price ceiling at  $p = MC$ .** *[Efficiency requires  $p = MC$ . The monopoly would want to charge above  $p = MC$ , and a price ceiling would prevent this]*
- E. A price ceiling at the price for which  $MR = MC$ .
- F. A price ceiling at  $p = AC$ .

## Problem A

*[Scenario A] If France dedicates its entire production capacity to producing croissants it can produce 200 units; if it dedicates it to the production of espresso, it can produce 100 units.*

*If Italy dedicates its entire production capacity to producing croissants it can produce 120 units; if it dedicates it to the production of espresso, it can produce 80 units.*

14. According to scenario A, which country has the absolute advantage in the production of croissants? [2pts]

*France has the absolute monopoly in croissants because it can produce more.*

15. According to scenario A, which country has the absolute advantage in the production of espresso? [2pts]

*France has the absolute monopoly in espresso because it can produce more.*

16. According to scenario A, which country has the comparative advantage in the production of croissants?  
[2pts]

*France can produce croissants at an opportunity cost of  $100/200 = 0.5$ . Italy can produce croissants at an opportunity cost of  $80/120 = 0.667$ . France has the comparative advantage in croissants.*

17. According to scenario A, which country has the comparative advantage in the production of espresso?  
[2pts]

*France can produce espresso at an opportunity cost of  $200/100 = 2$ . Italy can produce espresso at an opportunity cost of  $120/80 = 1.5$ . Italy has the comparative advantage in espresso.*

18. According to scenario A, how many units of croissants would France be willing to offer for 1 unit of Italian espresso?  
[2pts]

*France's opportunity cost for espresso is 2. Thus, it will accept any trade that requires less than 2 croissants per espresso.*

19. According to scenario A, how many units of croissants would Italy be willing to offer for 1 unit of French espresso?  
[2pts]

*Italy's opportunity cost for espresso is 1.5. Thus, it will accept any trade that requires less than 1.5 croissants per espresso.*

## Problem B

*[Scenario B] A market faces demand  $p = 90 - 2q$ . The marginal cost is given by  $MC = q$ .*

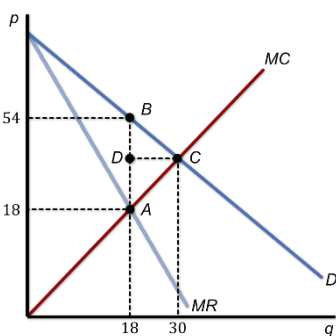
20. Find the equilibrium price if the market in scenario B is perfectly competitive. [2pts]

*For a PC market  $p = MC$  or  $90 - 2q = q$  or  $q = 30$ . Thus,  $p = 90 - 2 \cdot 30$  or  $p = 30$ .*

21. Find the equilibrium price if the market in scenario B is a monopoly. [3pts]

*For a monopoly  $MR = MC$  or  $90 - 4q = q$  or  $q = 18$ . Thus,  $p = 90 - 2 \cdot 18$  or  $p = 54$ .*

22. How much is the DWL, if the market in scenario B is a monopoly? [3pts]



*The easiest is to calculate the area of the triangle sideways (as if AB is the base and DC is the height).  $AB = 54 - 18 = 36$ .  $DC = 30 - 18 = 12$ .  $DWL = 36 \cdot 12 \cdot 0.5 = 216$ .*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

23. Consider the Solow model as it was developed in class. Assume that an economist had graphed the exact  $Y$ ,  $sY$ ,  $dK$  curves and had precisely calculated the steady-state GDP for Italy in June, 2019 before Covid-19 affects the country. In March, 2020 the virus hit Italy severely taking around 120,000 lives. Explain/describe what changes you would make to the Solow graph to update it regarding the impact of the virus on the economy. *[2 points penalty for exceeding 80 words]* [7pts]

*First, for sure, the  $Y$  curve must decrease because of the death of some workers, which decreases  $L$ . Second  $s$  may increase because of precaution. Thus,  $sY$  may decrease or increase depending on the relative magnitude of changes in  $Y$  and  $s$ . Most likely however, the decrease in  $Y$  will dominate and the steady-state  $Y$  will decrease. (57 words)*

24. A few months ago, the FED (the Central Bank of the US), increased the money supply in the economy by almost 4.5%. Contrary to expectations, inflation was measured by the US Statistics Bureau to be only 0.3%. What could possibly explain the paradox that the increase in money supply did not cause high inflation? *[2 points penalty for exceeding 80 words]* [7pts]

*There are at least 3 reasons to explain this. (a) The additional money was withheld by households for more difficult times and never circulated in the economy. (b) The economy was in the liquidity trap, no worthy investment projects existed and the additional money was never loaned out. (c) The increase in money was offset by an increase in GDP of 4.2%, and thus, inflation was only  $4.5\% - 4.2\% = 0.3\%$ . (68 words)*

25. Define what the Phillips relationship is and briefly explain why and when it holds. *[2 points penalty for exceeding 80 words]* [7pts]

*The Phillips relationship is the negative relationship between unemployment and inflation. When inflation increases, firms can increase their revenue by increasing prices but do not have to increase wages because those are bound by labor contracts. This increases profitability and boosts production, which increases the demand for labor and decreases unemployment. This, however, occurs only in the S-R. In the L-R labor contracts expire. (64 words)*

26. Briefly describe a real-world situation or an example of a market failure, where the price of a good or service fails to reflect its cost to society. [Hint: no definitions are required – just mention what the situation / example is and why it qualifies as such] *[2 points penalty for exceeding 80 words]* [7pts]

*The plastic bag. Its price is very low or zero and accounts only for the cost of producing it. The real societal cost of this product, though, is its disposal which is not reflected in the price of the plastic bag. (41 words)*

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END OF EXAM

## Midterm Test

February 2021

### Multiple Choice Tasks

Select the answer that most closely answers the question.

- Which of the following describes the existence of DWL in a market? [4pts]
  - The producer surplus exceeds the consumer surplus.
  - The equilibrium quantity in the market is lower than the perfectly competitive quantity.
  - The increase of equilibrium price in the market.
  - The increase of equilibrium quantity in the market.
- Which of the following will not cause a shift of the demand curve of Colgate toothpaste? [4pts]
  - An increase in the price of Oral-B toothpaste.
  - An increase in the price of Colgate toothpaste.
  - An increase in the price of Colgate toothbrushes.
  - An effective advertising campaign by Colgate.
  - An effective advertising campaign by Oral-B.
- Two identical sellers compete in a Cournot manner and they equilibrate when each sells 100 units. Suddenly, one of the sellers increases her quantity to 101 units. How is the other seller going to optimally react? [4pts]
  - He will increase his quantity, too.
  - He will decrease his quantity.
  - He will not react.
  - Any of the above is possible.
- Which of the following is necessary and sufficient for a firm to have market power? [4pts]
  - A downward sloping demand curve for the firm's brand.
  - A downward sloping demand curve for the product in general.
  - A U-shape AC curve.
  - A constant MC.
- A PC market distributes 60 units of surplus to the producers and 40 to the consumers. A regulator imposes a binding price ceiling, which causes the producer surplus to decrease to 20. Which of the following is true for consumer surplus? [4pts]
  - Consumer surplus decreased.
  - Consumer surplus remained the same.
  - Consumer surplus increased.
  - All of the above are possible.
- Two firms sell identical products and compete with prices. Both have  $MC=AC=5$  and  $FC=0$ . The price that the two firms charge is 9. Which of the following is most likely consistent with this scenario? [4pts]
  - Each of the two firms has enough productive capacity to cover the entire market on its own.

- B. The two firms compete not only once but repeatedly.
  - C. The market is regulated by a regulator who aims to eliminate the DWL.
  - D. All of the above.
7. A market has 12 sellers who do not interact with each-other. The products of those sellers are viewed by consumers as slightly differentiated. For which reason of the following will this market have a DWL? [4pts]
- A. Because sellers have market power due to differentiation.
  - B. Because the sellers do not interact.
  - C. Because there are too many sellers.
  - D. All of the above.
8. Which of the following could be a result of imposing barriers to entry to an otherwise PC market? [4pts]
- A. Economies of Scale could exist in the L-R.
  - B. More firms will enter in the L-R.
  - C. More firms will exit in the L-R.
  - D. It will be possible for L-R profit to not be zero.
9. Which of the following could indicate the existence of DWL in a market? [4pts]
- A. Cost exhibits dis-economies of scale.
  - B. There is a small number of firms in the market.
  - C. Price exceeds the marginal cost.
  - D. Price exceeds the average cost.
10. A natural monopoly is regulated so that price is equal to AC. Which of the following is true? [4pts]
- A. The quantity sold will be the efficient quantity.
  - B. The quantity sold will be the one for which AC is minimum.
  - C. The monopolist will reduce quantity sold to increase profit.
  - D. All of the above.
  - E. None of the above.
11. Which of the following is possible to happen? [4pts]
- A. L-R cost to exceed S-R cost for the same level of production.
  - B. PC profit to be positive in the L-R.
  - C. The MR and price to coincide when the firm has no market power.
  - D. The supply curve of a monopoly to be totally inelastic.
12. Which of the following could be considered a negative externality of cigarette smoking? [4pts]
- A. Smokers on average get sick more often, putting pressure on the public health system, and thus, increasing the burden on the taxpayers.
  - B. Smokers account for the cost of cigarettes but they fail to account for the decrease in their own life expectancy.
  - C. Smokers support the tobacco industry that provides jobs and income to several thousand families in the community.
  - D. All of the above.
13. Which of the following purchases by a firm most closely resembles a sunk cost? [4pts]
- A. The purchase of a photocopier.
  - B. The purchase of a company car.
  - C. The purchase of fuel.

- D. The purchase of business consulting services by another firm.
- E. The purchase of raw materials.

## Problem A

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**[Scenario A]** Two identical firms have AC constant and equal to 20 and face demand  $p = 920 - 6Q$ , where  $p$  is the price and  $Q$  is the total quantity available for sale in the market.

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14. According to scenario A, find the total quantity that will be sold in the market if the two firms collude. [4pts]
- A. Around 25 units total by both firms.
  - B. Around 50 units total by both firms.
  - C. Around 75 units total by both firms.
  - D. Around 100 units total by both firms.
  - E. Around 125 units total by both firms.
  - F. Around 150 units total by both firms.
  - G. Around 175 units total by both firms.
15. According to scenario A, find the total quantity that will be sold in the market if the two firms compete in quantities. [4pts]
- A. Around 25 units total by both firms.
  - B. Around 50 units total by both firms.
  - C. Around 75 units total by both firms.
  - D. Around 100 units total by both firms.
  - E. Around 125 units total by both firms.
  - F. Around 150 units total by both firms.
  - G. Around 175 units total by both firms.
16. According to scenario A, find the total quantity that will be sold in the market if the two firms behave as PC firms. [4pts]
- A. Around 25 units total by both firms.
  - B. Around 50 units total by both firms.
  - C. Around 75 units total by both firms.
  - D. Around 100 units total by both firms.
  - E. Around 125 units total by both firms.
  - F. Around 150 units total by both firms.
  - G. Around 175 units total by both firms.

## Problem B

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**[Scenario B]** Collin owns the right to decide between two plans that yield different payoffs to him and to David.

- If Collin chooses plan A: he receives 55 dollars and David receives 45 dollars.
- If Collin chooses plan B: he receives 62 dollars and David receives 26 dollars.

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17. According to scenario B, how much is the DWL if Collin chooses a plan according to his self-interest? [4pts]
- A. Around 0 dollars.
  - B. Around 4 dollars.
  - C. Around 8 dollars.
  - D. Around 12 dollars.
  - E. Around 24 dollars.
  - F. Around 60 dollars.



18. According to scenario B, what is the dollar value of the “right to choose” that Collin owns? [4pts]
- A. Around 0 dollars.
  - B. Around 4 dollars.
  - C. Around 8 dollars.
  - D. Around 12 dollars.
  - E. Around 24 dollars.
  - F. Around 60 dollars.
19. According to scenario B, describe how an impartial regulator can intervene to improve efficiency. How much would each man receive after the intervention? *[2 points penalty for exceeding 80 words]* [7pts]

### Short Answer Tasks

Answer the following questions in no more than 80 words.

20. A general patent provides legal monopoly rights to the inventor of a product for 20 years. In most cases, right after the expiration of a patent, a large number of firms enter the industry breaking the monopoly. Usually, the new entrants have no information about the market demand upon entry. Explain how they will figure out the equilibrium price when they do not know where the demand curve is. *[2 points penalty for exceeding 80 words]* [7pts]
21. List the circumstances or assumptions under which you would choose the kinked demand model to explain the overall behavior of a market. *[2 points penalty for exceeding 80 words]* [7pts]
22. Lately, it has been observed that some particular models of sneakers (shoes) are priced five, ten or even twenty times higher than the average sneaker model in the market. It is known for a fact, that cost of production for all sneaker models is similar, thus, cost should not be a factor explaining the price differential. Explain how sellers of sneakers can increase the price of those particular models so much higher than the other models. *[2 points penalty for exceeding 80 words]* [7pts]

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END OF TEST

## Midterm Test – KEY

February 2021

Answers included in this key are instructional. Students could receive full credit with shorter answers. This midterm was open-notes and open book.

### Multiple Choice Tasks

Select the answer that most closely answers the question.

- Which of the following describes the existence of DWL in a market? [4pts]
  - The producer surplus exceeds the consumer surplus. *[May happen without a DWL]*
  - The equilibrium quantity in the market is lower than the perfectly competitive quantity.** *[This is what causes a DWL]*
  - The increase of equilibrium price in the market. *[Not related to DWL]*
  - The increase of equilibrium quantity in the market. *[Not related to DWL]*
- Which of the following will not cause a shift of the demand curve of Colgate toothpaste? [4pts]
  - An increase in the price of Oral-B toothpaste. *[Oral-B is a substitute good. Its price will affect the demand for Colgate toothpaste through substitution]*
  - An increase in the price of Colgate toothpaste.** *[Own price does not affect demand]*
  - An increase in the price of Colgate toothbrushes. *[Colgate toothbrush is a complement good. Its price will affect the demand for Colgate toothpaste]*
  - An effective advertising campaign by Colgate. *[Advertising affects the demand of the good]*
  - An effective advertising campaign by Oral-B. *[Advertising of a substitute good will affect the demand of Colgate toothpaste through substitution]*
- Two identical sellers compete in a Cournot manner and they equilibrate when each sells 100 units. Suddenly, one of the sellers increases her quantity to 101 units. How is the other seller going to optimally react? [4pts]
  - He will increase his quantity, too.
  - He will decrease his quantity.**
  - He will not react.
  - Any of the above is possible.

*[Reaction curves in Cournot are downward slopping. This means that as the opponent's quantity increases, own quantity will decrease. The economic reason is that if own quantity increases too, the decrease in price will cause own profits to drop more]*
- Which of the following is necessary and sufficient for a firm to have market power? [4pts]
  - A downward slopping demand curve for the firm's brand.** *[If the demand curve is downward slopping, MR will be below it. Thus, the intersection MC=MR will happen below demand]*
  - A downward slopping demand curve for the product in general. *[This can happen even in PC markets where market power is zero]*
  - A U-shape AC curve. *[AC does not affect market power]*
  - A constant MC. *[Constant MC does not determine that price will be above it]*

5. A PC market distributes 60 units of surplus to the producers and 40 to the consumers. A regulator imposes a binding price ceiling, which causes the producer surplus to decrease to 20. Which of the following is true for consumer surplus? [4pts]

- A. Consumer surplus decreased.
- B. Consumer surplus remained the same.
- C. Consumer surplus increased.
- D. All of the above are possible.**

*[The total gains from trade are  $60 + 40 = 100$ . After the price ceiling, producers receive 20 out of 100, so there is another 80 left, which will be distributed between consumer surplus and DWL (price ceiling in PC causes DWL). From the information given, we do not know how much the DWL will end up being. If it is above 40, A will be correct. If it is below 20, C will be correct. If it is between 20 and 40, B will be correct]*

6. Two firms sell identical products and compete with prices. Both have  $MC=AC=5$  and  $FC=0$ . The price that the two firms charge is 9. Which of the following is most likely consistent with this scenario? [4pts]

- A. Each of the two firms has enough productive capacity to cover the entire market on its own. *[This would enforce that  $p = 5$ ]*
- B. The two firms compete not only once but repeatedly.** *[This is a resolution to the Bertrand paradox]*
- C. The market is regulated by a regulator who aims to eliminate the DWL. *[This would enforce  $p = 5$ ]*
- D. All of the above.

*[According to the Bertrand competition, we should see  $p = 5$ . The fact that  $p = 9$  assumes that one of the 3 Bertrand paradox resolutions should happen]*

7. A market has 12 sellers who do not interact with each-other. The products of those sellers are viewed by consumers as slightly differentiated. For which reason of the following will this market have a DWL? [4pts]

- A. Because sellers have market power due to differentiation.** *[Valid]*
- B. Because the sellers do not interact. *[Does not affect the existence of DWL]*
- C. Because there are too many sellers. *[This increases competition and decreases DWL]*
- D. All of the above.

8. Which of the following could be a result of imposing barriers to entry to an otherwise PC market? [4pts]

- A. Economies of Scale could exist in the L-R. *[Barriers to entry do not affect LAC]*
- B. More firms will enter in the L-R. *[This is not possible with barriers]*
- C. More firms will exit in the L-R. *[This will happen only if there are short-run losses and is irrelevant with barriers]*
- D. It will be possible for L-R profit to not be zero.** *[Entry will not be possible, so short-run profit can be maintained in the long-run]*

9. Which of the following could indicate the existence of DWL in a market? [4pts]

- A. Cost exhibits dis-economies of scale. *[LAC is not related to DWL]*
- B. There is a small number of firms in the market. *[This can cause DWL but not always. For instance, the Bertrand duopoly has zero DWL]*
- C. Price exceeds the marginal cost.** *[Market power always create DWL]*
- D. Price exceeds the average cost. *[Profit does not always cause DWL]*

10. A natural monopoly is regulated so that price is equal to AC. Which of the following is true? [4pts]

- A. The quantity sold will be the efficient quantity. *[This would happen only if  $p = MC$ ]*

- B. The quantity sold will be the one for which AC is minimum. *[In natural monopolies the minimum LAC is for quantities way above the maximum quantity that can ever be sold in the market]*
- C. The monopolist will reduce quantity sold to increase profit. *[If the monopolist decreases the quantity AC will increase, yielding losses]*
- D. All of the above.
- E. **None of the above.**
11. Which of the following is possible to happen? [4pts]
- A. L-R cost to exceed S-R cost for the same level of production. *[For a given level of production, LAC will always be as low or lower than the S-R AC]*
- B. PC profit to be positive in the L-R. *[Entry eliminates L-R profit in PC]*
- C. **The MR and price to coincide when the firm has no market power.** *[This is always the case when the seller is a price taker]*
- D. The supply curve of a monopoly to be totally inelastic. *[Monopolies do not have supply curves]*
12. Which of the following could be considered a negative externality of cigarette smoking? [4pts]
- A. **Smokers on average get sick more often, putting pressure on the public health system, and thus, increasing the burden on the taxpayers.** *[Negative externality from smokers to taxpayers]*
- B. Smokers account for the cost of cigarettes but they fail to account for the decrease in their own life expectancy. *[Market failure but not an externality (imposed on the same person)]*
- C. Smokers support the tobacco industry that provides jobs and income to several thousand families in the community. *[Positive externality]*
- D. All of the above.
13. Which of the following purchases by a firm most closely resembles a sunk cost? [4pts]
- A. The purchase of a photocopier. *[Can be resold and recover part of the cost]*
- B. The purchase of a company car. *[Can be resold and recover part of the cost]*
- C. The purchase of fuel. *[Can be resold and recover part of the cost]*
- D. **The purchase of business consulting services by another firm.** *[Consulting is company specific. It will have zero value for another firm]*
- E. The purchase of raw materials. *[Can be resold and recover part of the cost]*

## Problem A

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**[Scenario A]** Two identical firms have AC constant and equal to 20 and face demand  $p = 920 - 6Q$ , where  $p$  is the price and  $Q$  is the total quantity available for sale in the market.

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14. According to scenario A, find the total quantity that will be sold in the market if the two firms collude. [4pts]
- A. Around 25 units total by both firms.
- B. Around 50 units total by both firms.
- C. **Around 75 units total by both firms.**
- D. Around 100 units total by both firms.
- E. Around 125 units total by both firms.
- F. Around 150 units total by both firms.
- G. Around 175 units total by both firms.
- [MR = 920 - 12Q. Then MR = MC entails 920 - 12Q = 20 or 12Q = 900 or Q = 75]*
15. According to scenario A, find the total quantity that will be sold in the market if the two firms compete in quantities. [4pts]

- A. Around 25 units total by both firms.
- B. Around 50 units total by both firms.
- C. Around 75 units total by both firms.
- D. Around 100 units total by both firms.**
- E. Around 125 units total by both firms.
- F. Around 150 units total by both firms.
- G. Around 175 units total by both firms.

*[Demand is  $p = 920 - 6q_1 - 6q_2$ . Marginal revenue for firm 1 is  $MR_1 = 920 - 6q_2 - 12q_1$ . Then,  $MR_1 = MC$  or  $920 - 6q_2 - 12q_1 = 20$ . Now, because firms 1 and 2 are symmetric, we can impose that  $q_2 = q_1$  at equilibrium. Thus,  $920 - 6q_1 - 12q_1 = 20$  or  $18q_1 = 900$  or  $q_1 = q_2 = 50$ . Thus,  $Q = 100$ ]*

16. According to scenario A, find the total quantity that will be sold in the market if the two firms behave as PC firms. [4pts]

- A. Around 25 units total by both firms.
- B. Around 50 units total by both firms.
- C. Around 75 units total by both firms.
- D. Around 100 units total by both firms.
- E. Around 125 units total by both firms.
- F. Around 150 units total by both firms.**
- G. Around 175 units total by both firms.

*[In this case,  $p = MC$  or  $920 - 6Q = 20$  or  $6Q = 900$  or  $Q = 150$ ]*

## Problem B

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**[Scenario B]** Collin owns the right to decide between two plans that yield different payoffs to him and to David.

- If Collin chooses plan A: he receives 55 dollars and David receives 45 dollars.

- If Collin chooses plan B: he receives 62 dollars and David receives 26 dollars.

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17. According to scenario B, how much is the DWL if Collin chooses a plan according to his self-interest? [4pts]

- A. Around 0 dollars.
- B. Around 4 dollars.
- C. Around 8 dollars.
- D. Around 12 dollars.**
- E. Around 24 dollars.
- F. Around 60 dollars.

*[The first plan delivers  $55 + 45 = 100$  dollars. The second plan delivers  $62 + 26 = 88$  dollars. The DWL is  $100 - 88 = 12$  dollars]*

18. According to scenario B, what is the dollar value of the “right to choose” that Collin owns? [4pts]

- A. Around 0 dollars.
- B. Around 4 dollars.
- C. Around 8 dollars.**
- D. Around 12 dollars.
- E. Around 24 dollars.
- F. Around 60 dollars.

*[Without the right to choose, Collin would make at least 55 dollars. With the right to choose he makes 62 dollars. The value of the right to choose as an asset is  $62 - 55 = 7$  dollars]*

19. According to scenario B, describe how an impartial regulator can intervene to improve efficiency. How much would each man receive after the intervention? *[2 points penalty for exceeding 80 words]* [7pts]

*The regulator can tax David by 7 units and pay them to Collin to buy the right to choose plan. Then, the regulator can choose plan A, which delivers maximum efficiency. Collin receives  $55 + 7 = 62$  dollars. David receives  $45 - 7 = 38$  dollars. David is a winner from regulation without David to be a loser. The DWL is eliminated. [62 words]*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

20. A general patent provides legal monopoly rights to the inventor of a product for 20 years. In most cases, right after the expiration of a patent, a large number of firms enter the industry breaking the monopoly. Usually, the new entrants have no information about the market demand upon entry. Explain how they will figure out the equilibrium price when they do not know where the demand curve is. *[2 points penalty for exceeding 80 words]* [7pts]

*Have sellers known their own supply curves, they can set a price and the market will show if it is the right one. If at that price they run a quantity surplus, they will decrease the price. If they face a shortage, they will increase the price. Trial and error will soon lead to the equilibrium price. [57 words]*

21. List the circumstances or assumptions under which you would choose the kinked demand model to explain the overall behavior of a market. *[2 points penalty for exceeding 80 words]* [7pts]

- 1. There are few firms.*
- 2. There is interaction between firms.*
- 3. Product is homogeneous.*
- 4. There exists a steady prevailing price determined in the market somehow.*
- 5. If a firm lowers the price, the other firms will follow more promptly compared to if the firm had increased price. [49 words]*

22. Lately, it has been observed that some particular models of sneakers (shoes) are priced five, ten or even twenty times higher than the average sneaker model in the market. It is known for a fact, that cost of production for all sneaker models is similar, thus, cost should not be a factor explaining the price differential. Explain how sellers of sneakers can increase the price of those particular models so much higher than the other models. *[2 points penalty for exceeding 80 words]* [7pts]

*The price in the market is determined by the demand = supply. The sellers can affect the demand with differentiation, branding and advertisement but not to the point that it will yield 10x or 20x the price. They can only do this effectively only by limiting the supply drastically for some models (exclusive, limited, collectible, or other such non-sense) determining high market price for these models. [66 words]*

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END OF TEST

# Final EXAM

Dec 2, 2020

Answers included in this key are instructional. Students could receive full credit with shorter answers. This midterm was open-notes and open book.

## Multiple Choice Tasks

Select the answer that most closely answers the question.

- Which of the following is most likely to happen in the commodity market after the CB decreases the interest rate? [4pts]
  - Investment will increase.
  - Money demand will increase.
  - Government spending will increase.
  - The depreciation rate will decrease.
- Which of the following would be a possible way for the CB to increase the interest rate? [4pts]
  - To increase the money demand.
  - To increase the money supply.
  - To decrease the money demand.
  - To decrease the money supply.
- Which of the following is most likely to cause the national debt to increase? [4pts]
  - Expansionary monetary policy.
  - Expansionary fiscal policy.
  - A minimum wage policy.
  - A price floor in all agricultural products.
- One of the social costs of inflation that we discussed in the lecture was that "it creates administrative costs and inefficiencies". Which of the following refers to this particular social cost? [4pts]
  - Firms cut down on investment because of the uncertain economic environment.
  - Individuals on fixed incomes suffer losses of purchasing power.
  - Inflation may distort credit relations.
  - Productive resources are used for updating the prices instead of producing output.
- The government increases  $G$  with the intention to cause  $Y$  to grow. Which of the following is most likely to happen if the CB does not accommodate the policy? [4pts]
  - Without the accommodation,  $Y$  will not increase.
  - Without the accommodation, it will take more time for  $Y$  to increase.
  - Without the accommodation,  $Y$  will increase in a turbulent and volatile way.
  - Without the accommodation,  $Y$  will increase in a steady manner but the interest rate will be under pressure to decrease.
- Which of the following reasons could be a plausible explanation for an economy that exhibits an actual output ( $Y$ ) which exceeds the steady-state output ( $Y^*$ )? [4pts]

- A. The economy has over-performed the expectations of the analysts.
  - B. A technological discovery allowed production to become more efficient.
  - C. A sudden sharp decrease in the saving rate by households ( $s$ ).
  - D. A sudden increase in the productivity of labor ( $h$ ).
7. The capital stock ( $K$ ) in a country is 200 and the total output ( $Y$ ) is 550. Economists estimate that in the current year the economy will grow with 1.4%. Suddenly, however, a hurricane occurs and destroys 60 units of capital. Which of the following should be expected after the hurricane? [4pts]
- A. The steady-state output of this country will increase.
  - B. The steady-state output of this country will not be affected.
  - C. The steady-state output of this country decrease.
8. Assume that the Value of the Marginal Product of Labor decreases. Which of the following will happen in a perfectly competitive labor market? [4pts]
- A. The demand for labor will increase.
  - B. The demand of labor will decrease.
  - C. The supply of labor will decrease.
  - D. The supply of labor will increase.
9. Which of the following historic events was ignited by a gap in regulation that allowed commercial banks to use deposits to play the stock market? [4pts]
- A. The Global Financial Crisis.
  - B. The Greek Crisis.
  - C. The Great Depression.
  - D. The Covid-19 crisis.
  - E. The Industrial Revolution.
  - F. The Renaissance.
  - G. The World Cup of 1990.
  - H. The Fall of Rome.
  - I. The disappearance of dinosaurs.
10. Which of the following could be a reason for the CB to not be able to lower the interest rate? [4pts]
- A. The economy is in the liquidity trap.
  - B. A decrease in money demand.
  - C. Prices are too high.
  - D. Output is too high.
11. Two sellers compete in a Cournot manner. The Cournot equilibrium is when  $q_1^* = q_2^* = 50$ . However, the first seller has already produced  $q_1 = 65$  and cannot undo the production. The second seller knows this. What is the optimal way for the second seller to react? [4pts]
- A. To produce more than 65 units.
  - B. To also produce 65 units.
  - C. To produce between 50 and 65 units.
  - D. To produce less than 50 units.
12. Two firms compete in a Bertrand manner. The marginal cost is 12 dollars for both and it is constant. Both firms price at 15 dollars. Which of the following may explain the pricing? [4pts]
- A. No firm can cover the entire demand on its own.
  - B. The firms interact for more than one periods.



- C. The firms sell a differentiated product.
- D. All of the above.

13. Which of the following violates Singapore's Competition Act? [4pts]

- A. A private firm that controls the 95% of the market.
- B. A private firm that has a cost advantage over a rival and prices below the rival's cost to drive the rival out of business.
- C. Both of the above.
- D. None of the above.

## Problem A

[Scenario A] Households in an economy have basic minimum level of consumption equal to 10 units and a marginal propensity of consumption equal to 0.6. The private investment is 150 units. Government taxes household income with 20% and spends 100 units.

14. According to scenario A, what is the equilibrium income in this economy? [4pts]

- A. Around 500 units.
- B. Around 700 units.
- C. Around 900 units.
- D. Around 1,100 units.
- E. Around 1,300 units.
- F. Around 1,600 units.

15. According to scenario A, by how much should the government change its spending if it wants to increase the equilibrium income by 10%? [4pts]

- A. Increase government spending by around 5 units.
- B. Increase government spending by around 15 units.
- C. Increase government spending by around 25 units.
- D. Increase government spending by around 35 units.
- E. Decrease government spending by around 5 units.
- F. Decrease government spending by around 15 units.
- G. Decrease government spending by around 25 units.
- H. Decrease government spending by around 35 units.

16. Explain what is/are the economic reason(s) for which a change in government spending will affect the equilibrium income in an economy. *[2 points penalty for exceeding 80 words]* [7pts]

## Problem B

[Scenario B] Katerina is the unique seller of lemonade in the neighborhood. She faces a demand for lemonade  $p = 28 - 3q$ , where  $q$  are glasses of lemonade and  $p$  is the price per glass. Her marginal cost is  $MC = q$  and her fixed cost is 2.

17. Based on scenario B, how many glasses of lemonade should Katerina produce in order to maximize her profit? [4pts]

- A. Around 1 glass.
- B. Around 2 glasses.
- C. Around 3 glasses.
- D. Around 4 glasses.
- E. Around 5 glasses.

- F. Around 6 glasses.
- G. Around 7 glasses.
- H. Around 8 glasses.
- I. Around 9 glasses.
- J. Around 10 glasses.

18. Based on scenario B, how many glasses of lemonade should Katerina produce in order to maximize her profit if she acted as a PC firm? [4pts]

- A. Around 1 glass.
- B. Around 2 glasses.
- C. Around 3 glasses.
- D. Around 4 glasses.
- E. Around 5 glasses.
- F. Around 6 glasses.
- G. Around 7 glasses.
- H. Around 8 glasses.
- I. Around 9 glasses.
- J. Around 10 glasses.

19. Based on scenario B, how much S-R profit would Katerina make if she acted as a PC firm? [4pts]

- A. Around 0 dollars.
- B. Around 10 dollars.
- C. Around 20 dollars.
- D. Around 30 dollars.
- E. Around 40 dollars.
- F. Around 50 dollars.

## Short Answer Tasks

Answer the following questions.

20. Joe Biden (most likely) will be the new President of the United States from January 2021. Political analysts clearly consider Joe Biden to be placed politically towards the left compared to the previous administration. Based only on the latter, in just two straight forward sentences, describe what changes you would expect regarding the fiscal policy of the US in the next four years. *[2 points penalty for exceeding 80 words]* [7pts]

21. To fight the Covid-19 adverse effects in the labor market, the government of Singapore implemented measures that prevent companies from hiring non-Singaporeans for jobs that pay below \$5,000 per month. Explain the effect of this policy on the equilibrium wage by comparing the equilibrium wage before the pandemic (refer to it as 'W1') and the equilibrium wage after the measures (refer to it as 'W2'). *[2 points penalty for exceeding 80 words]* [7pts]

22. Before the pandemic, surgical masks were priced around \$9 per box. During the first months of the pandemic (before masks become mandatory), they were priced around \$25 per box on average. Today that the use of masks is mandatory, the average price of a box fell to around \$6. A similar trend in prices of masks has been observed all over the world. Explain how it is possible that the demand of a good is increasing and its price first increases but then ends up decreasing even below its initial level. *[2 points penalty for exceeding 80 words]* [7pts]

## Final EXAM – KEY

Dec 2, 2020

Answers included in this key are instructional. Students could receive full credit with shorter answers. This midterm was open-notes and open book.

### Multiple Choice Tasks

Select the answer that most closely answers the question.

- Which of the following is most likely to happen in the commodity market after the CB decreases the interest rate? [4pts]
  - Investment will increase.** *[Correct, it is 'link 2']*
  - Money demand will increase. *[Not in the commodity market, and wrong]*
  - Government spending will increase. *[Not related to the interest rate]*
  - The depreciation rate will decrease. *[Not related to the interest rate]*
- Which of the following would be a possible way for the CB to increase the interest rate? [4pts]
  - To increase the money demand. *[Not controlled by the CB]*
  - To increase the money supply. *[This will decrease the interest rate]*
  - To decrease the money demand. *[Not controlled by the CB]*
  - To decrease the money supply.**
- Which of the following is most likely to cause the national debt to increase? [4pts]
  - Expansionary monetary policy. *[It would primarily cause inflation]*
  - Expansionary fiscal policy.** *[The difference T-G would increase, possibly stockpiling debt]*
  - A minimum wage policy. *[Minimum wage costs concern the firms]*
  - A price floor in all agricultural products. *[Price floors concern producers and consumers]*
- One of the social costs of inflation that we discussed in the lecture was that "it creates administrative costs and inefficiencies". Which of the following refers to this particular social cost? [4pts]
  - Firms cut down on investment because of the uncertain economic environment.
  - Individuals on fixed incomes suffer losses of purchasing power.
  - Inflation may distort credit relations.
  - Productive resources are used for updating the prices instead of producing output.** *[By administrative costs and inefficiencies, we mean that resources are taken out of production in order to deal with the costs of inflation]*
- The government increases  $G$  with the intention to cause  $Y$  to grow. Which of the following is most likely to happen if the CB does not accommodate the policy? [4pts]
  - Without the accommodation,  $Y$  will not increase.
  - Without the accommodation, it will take more time for  $Y$  to increase.
  - Without the accommodation,  $Y$  will increase in a turbulent and volatile way.**
  - Without the accommodation,  $Y$  will increase in a steady manner but the interest rate will be under pressure to decrease.

*[Links 1 and 2 will start activating one after the other in a vicious circle. Y will increase, then rebound, then rebound to the rebound etc. creating short-run fluctuations]*

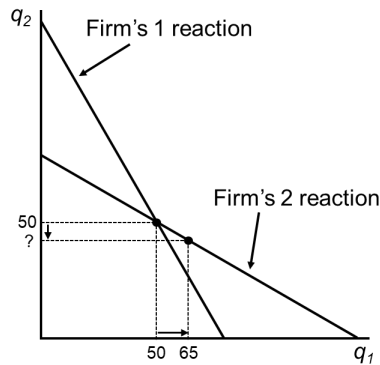
6. Which of the following reasons could be a plausible explanation for an economy that exhibits an actual output ( $Y$ ) which exceeds the steady-state output ( $Y^*$ )? [4pts]
- A. The economy has over-performed the expectations of the analysts. *[Still, the actual steady-state would be above the current income]*
  - B. A technological discovery allowed production to become more efficient. *[This would increase the steady-state further, making it less possible to operate above the steady-state]*
  - C. A sudden sharp decrease in the saving rate by households ( $s$ ).** *[The economy was heading upwards towards the steady-state. Then,  $s$  decreased moving the steady-state below the current  $Y$ . This explains  $Y$  to be above  $Y^*$ ]*
  - D. A sudden increase in the productivity of labor ( $h$ ). *[This would increase the steady-state further, making it less possible to operate above the steady-state]*
7. The capital stock ( $K$ ) in a country is 200 and the total output ( $Y$ ) is 550. Economists estimate that in the current year the economy will grow with 1.4%. Suddenly, however, a hurricane occurs and destroys 60 units of capital. Which of the following should be expected after the hurricane? [4pts]
- A. The steady-state output of this country will increase.
  - B. The steady-state output of this country will not be affected.**
  - C. The steady-state output of this country decrease.
- [The shock reduces the capital ( $K$ ).  $K$  is on the horizontal axis of the Solow graph. Any change to a variable on the axis does not cause the curves to shift. Thus, the steady-state will not be affected as the curves will keep intersecting at the same point. The reduction in capital will just bring the economy back in its chase for the same steady-state by reducing the current  $K$  and  $Y$ ]*
8. Assume that the Value of the Marginal Product of Labor decreases. Which of the following will happen in a perfectly competitive labor market? [4pts]
- A. The demand for labor will increase.
  - B. The demand of labor will decrease.** *[Workers now produce less value, so they are less useful to employers. Employers will demand less workers]*
  - C. The supply of labor will decrease. *[Supply will not be affected]*
  - D. The supply of labor will increase. *[Supply will not be affected]*
9. Which of the following historic events was ignited by a gap in regulation that allowed commercial banks to use deposits to play the stock market? [4pts]
- A. The Global Financial Crisis. *[Due to a bubble in the real estate market]*
  - B. The Greek Crisis. *[Was a generalized systemic crisis]*
  - C. The Great Depression.** *[Refer to the analysis in lecture 11]*
  - D. The Covid-19 crisis. *[Due to Covid-19]*
  - E. The Industrial Revolution. *[Due to technology innovations]*
  - F. The Renaissance. *[Due to Humanism]*
  - G. The World Cup of 1990. *[Due to Diego Maradona]*
  - H. The Fall of Rome. *[Due to government corruption and political instability]*
  - I. The disappearance of dinosaurs. *[Due to a meteorite]*
10. Which of the following could be a reason for the CB to not be able to lower the interest rate? [4pts]
- A. The economy is in the liquidity trap.** *[Increase in  $M_S$  does not intersect with  $M_D$  at a lower  $r$ ]*
  - B. A decrease in money demand. *[If anything, this would make a decrease in  $r$  easier]*

- C. Prices are too high. *[Completely irrelevant]*
- D. Output is too high. *[Completely irrelevant]*

11. Two sellers compete in a Cournot manner. The Cournot equilibrium is when  $q_1^* = q_2^* = 50$ . However, the first seller has already produced  $q_1 = 65$  and cannot undo the production. The second seller knows this. What is the optimal way for the second seller to react? [4pts]

- A. To produce more than 65 units.
- B. To also produce 65 units.
- C. To produce between 50 and 65 units.
- D. To produce less than 50 units.**

*[According to its optimal reaction curve, firm 2 will produce less than 50 now that its competitor is committed to produce more than 50. If firm 2 does not reduce its production below 50, it will lose revenues because price will be reduced more]*



12. Two firms compete in a Bertrand manner. The marginal cost is 12 dollars for both and it is constant. Both firms price at 15 dollars. Which of the following may explain the pricing? [4pts]

- A. No firm can cover the entire demand on its own.
- B. The firms interact for more than one periods.
- C. The firms sell a differentiated product.
- D. All of the above.**

*[The question hints the resolutions of the Bertrand paradox. All three of them were discussed extensively in lecture 5]*

13. Which of the following violates Singapore's Competition Act? [4pts]

- A. A private firm that controls the 95% of the market. *[Not a violation per se. A firm can have 95% of the market because it is just better. This is permitted]*
- B. A private firm that has a cost advantage over a rival and prices below the rival's cost to drive the rival out of business. *[Predatory pricing is not allowed. Here, however, we do not have predatory pricing because the firm does not price under its own cost. It is not illegal to price below your competitor's cost]*
- C. Both of the above.
- D. None of the above.**

## Problem A

[Scenario A] Households in an economy have basic minimum level of consumption equal to 10 units and a marginal propensity of consumption equal to 0.6. The private investment is 150 units. Government taxes household income with 20% and spends 100 units.

14. According to scenario A, what is the equilibrium income in this economy? [4pts]

- A. **Around 500 units.**
- B. Around 700 units.
- C. Around 900 units.
- D. Around 1,100 units.
- E. Around 1,300 units.
- F. Around 1,600 units.

$$Y = C + I + G \text{ or } Y = 10 + 0.6(Y - T) + 150 + 100 \text{ or } Y = 260 + 0.6Y - 0.6(0.2Y) \text{ or } Y = 260 + 0.6Y - 0.12Y \text{ or } Y = 260/0.52 \text{ or } Y = 500.$$

15. According to scenario A, by how much should the government change its spending if it wants to increase the equilibrium income by 10%? [4pts]

- A. Increase government spending by around 5 units.
- B. Increase government spending by around 15 units.
- C. **Increase government spending by around 25 units.**
- D. Increase government spending by around 35 units.
- E. Decrease government spending by around 5 units.
- F. Decrease government spending by around 15 units.
- G. Decrease government spending by around 25 units.
- H. Decrease government spending by around 35 units.

*We need output to become  $Y = 550$ . From the previous question we can see that  $Y = 260/0.52$ .*

*Now, the 260 is the sum of the  $G + I$  + minimum level of consumption and includes 100 units of  $G$ .*

*Thus, we can write it as  $Y = (G + 160)/0.52$ . So,  $550 = (G + 160)/0.52$  or  $286 = G + 160$  or  $G = 286 - 160$  or  $G = 126$ . Thus,  $G$  must increase by 26 units.*

16. Explain what is/are the economic reason(s) for which a change in government spending will affect the equilibrium income in an economy. **[2 points penalty for exceeding 80 words]** [7pts]

*The increase in  $G$  has two effects on  $Y$ . First, it directly increases the aggregate expenditure. Second, it indirectly affects  $Y$  by increasing  $C$ . (24 words)*

## Problem B

[Scenario B] Katerina is the unique seller of lemonade in the neighborhood. She faces a demand for lemonade  $p = 28 - 3q$ , where  $q$  are glasses of lemonade and  $p$  is the price per glass. Her marginal cost is  $MC = q$  and her fixed cost is 2.

17. Based on scenario B, how many glasses of lemonade should Katerina produce in order to maximize her profit? [4pts]

- A. Around 1 glass.
- B. Around 2 glasses.
- C. Around 3 glasses.
- D. **Around 4 glasses.**
- E. Around 5 glasses.
- F. Around 6 glasses.

- G. Around 7 glasses.
- H. Around 8 glasses.
- I. Around 9 glasses.
- J. Around 10 glasses.

*Katerina's marginal revenue is  $MR = 28 - 6q$ . Profit maximization implies  $MR = MC$  or  $28 - 6q = q$  or  $7q = 28$  or  $q = 4$ .*

18. Based on scenario B, how many glasses of lemonade should Katerina produce in order to maximize her profit if she acted as a PC firm? [4pts]

- A. Around 1 glass.
- B. Around 2 glasses.
- C. Around 3 glasses.
- D. Around 4 glasses.
- E. Around 5 glasses.
- F. Around 6 glasses.
- G. Around 7 glasses.**
- H. Around 8 glasses.
- I. Around 9 glasses.
- J. Around 10 glasses.

*Profit maximization implies  $p = MC$  or  $28 - 3q = q$  or  $4q = 28$  or  $q = 7$ .*

19. Based on scenario B, how much S-R profit would Katerina make if she acted as a PC firm? [4pts]

- A. Around 0 dollars.
- B. Around 10 dollars.
- C. Around 20 dollars.**
- D. Around 30 dollars.
- E. Around 40 dollars.
- F. Around 50 dollars.

*If Katerina acts as a PC firm, the price will be  $p = 28 - 3 \cdot 7$  or  $p = 7$ . Thus, her revenue will be  $p \cdot q = 7 \cdot 7 = 49$ . Her FC is 2 and her VC is  $1 + 2 + 3 + 4 + 5 + 6 + 7 = 28$ . Thus, her total cost is  $28 + 2 = 30$ . Therefore, her profit is:  $49 - 30 = 19$ .*

## Short Answer Tasks

Answer the following questions.

20. Joe Biden (most likely) will be the new President of the United States from January 2021. Political analysts clearly consider Joe Biden to be placed politically towards the left compared to the previous administration. Based only on the latter, in just two straight forward sentences, describe what changes you would expect regarding the fiscal policy of the US in the next four years. *[2 points penalty for exceeding 80 words]* [7pts]

*Since Biden is left leaning, I would expect expansionary fiscal policy mostly by increasing G in contrast to his predecessor who mainly decreased t. I expect Biden to partially increase t in order to not fund the expansion of G entirely with debt. (43 words)*

21. To fight the Covid-19 adverse effects in the labor market, the government of Singapore implemented measures that prevent companies from hiring non-Singaporeans for jobs that pay below \$5,000 per month. Explain the effect of this policy on the equilibrium wage by comparing the equilibrium wage before the pandemic (refer to it as 'W1') and the equilibrium wage after the measures (refer to it as 'W2'). *[2 points penalty for exceeding 80 words]* [7pts]

*Two major shocks happened between W1 and W2. First, the recession decreased labor demand, which put the wage in downward pressure. Second, the measures cut off many foreigners from the Singaporean job market decreasing labor supply. The latter put upward pressure to the wage. W1 can be higher or lower than W2 depending on the relative intensity of those two shocks. (61 words)*

22. Before the pandemic, surgical masks were priced around \$9 per box. During the first months of the pandemic (before masks become mandatory), they were priced around \$25 per box on average. Today that the use of masks is mandatory, the average price of a box fell to around \$6. A similar trend in prices of masks has been observed all over the world. Explain how it is possible that the demand of a good is increasing and its price first increases but then ends up decreasing even below its initial level. *[2 points penalty for exceeding 80 words]* [7pts]

*Answer 1: Before the pandemic, surgical masks were monopolistically competitive products. The initial price spike (\$25) is explained by the sudden increase in demand which could not be met by firms in the S-R. In the L-R, however, profits attracted entry, the market became PC and price dropped lower than the initial \$9 (51 words).*

*Answer 2 (alternative): Before the pandemic, demand was small and producers operated small scales. As demand increased, in the S-R, firms produced towards their decreasing returns to scale where costs were much higher, so they had to increase prices. In the L-R, firms addressed the high demand by adopting larger scales that utilized economies of scale and dropped costs dramatically, allowing prices to fall more than initially. (64 words).*

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END OF EXAM



## Midterm Test

October 2020

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. Which of the following markets should be expected to yield a dead weight loss? [4pts]
  - A. A non-collusive oligopoly where sellers compete with respect to quantity.
  - B. A natural monopoly regulated for efficiency.
  - C. A perfectly competitive market which is profitable in the short-run period.
  - D. All of the above will produce a dead weight loss.
  - E. None of the above will produce a dead weight loss.
2. Which of the following can be described as a positive externality failure? [4pts]
  - A. Fruits and vegetables are healthy but they are too expensive for Peter to buy a sufficient quantity of those to benefit his health.
  - B. Electric vehicles are environmentally friendly but they are too expensive for Singaporeans to be able to afford to buy a sufficient number of those for the environment to benefit.
  - C. The gardener uses a noisy leaf-blower machine to clean the yard faster instead of a broom that would take him longer to do the cleaning but without bothering the block's residents.
  - D. All of the above.
3. Which of the following situations would be suitable for an economist to use the kinked-demand model? [4pts]
  - A. In an oligopoly where no collusion is established and competition is intense.
  - B. In an oligopoly where no collusion is established and competition is not intense.
  - C. In an oligopoly where collusion is established but sellers do not trust each-other.
  - D. In an oligopoly where collusion is established and sellers trust each-other.
4. Which of the following will happen to a Cournot duopoly like the one we presented in the lecture, if a regulator decides to completely lift the barriers to entry in the industry? [4pts]
  - A. Average costs will be decreased.
  - B. Fixed costs only will be decreased.
  - C. Profits will be eliminated.
  - D. Profits will be eliminated only in the long-run period.
5. Which of the following monopolists will most likely have the lowest market power? [4pts]
  - A. A monopolist who faces a near totally inelastic demand curve.
  - B. A monopolist who faces a near totally elastic demand curve.
  - C. A monopolist who faces a U-shaped AC curve.
  - D. A monopolist who faces a horizontal AC curve.

6. Last year, Anastasia decided to buy a Netflix subscription. Yesterday, Netflix announced a price increase, so from this month, Anastasia has to pay 1 dollar more per month if she wants to keep watching Netflix. Which of the following is certain? [4pts]
- A. Anastasia will stop her subscription.
  - B. Anastasia will get Netflix for fewer months.
  - C. Anastasia's consumer surplus will decrease.
  - D. Anastasia will subscribe to a complete streaming service.
7. Jack owns an airport shuttle service. He employs a driver for 100 dollars per day and has leased a minivan for two years for 50 dollars per day. The minivan executes 10 trips to the airport daily for a revenue 25 dollars per trip. The cost of fuel for each trip is 12 dollars. Which of the following is the best option for Jack? [4pts]
- A. Jack should keep operating the service indefinitely by renewing the minivan lease when it expires.
  - B. Jack should shut down the service immediately to avoid losses.
  - C. Jack should shut down the service after the minivan lease expires.
  - D. Jack should reduce the amount of daily rides to bring his profit up.
8. Joanna is a freelance photographer, who takes on average 1 job per day. Joanna has leased her equipment for three years for 20 dollars per day, and she also employs her brother Fred as an assistant for 70 dollars per job. Which of the following will occur if Fred is given a raise and he is now paid 80 dollars per job? [4pts]
- A. Joanna's FC will increase.
  - B. Joanna's VC will increase.
  - C. Both of the above.
  - D. None of the above.
9. Which of the following is consistent with a budget constraint line, which starts from 20 burgers on the vertical axis, and ends at 10 beers on the horizontal axis? [4pts]
- A. The price of burgers is equal to the price of beer.
  - B. The price of burgers exceeds the price of beer.
  - C. The price of burgers is lower than the price of beer.
  - D. All of the above could be consistent with this budget line.
10. Which of the following is consistent with a nearly vertical demand curve by a consumer? [4pts]
- A. Even large changes in price, will not affect the quantity this consumer buys.
  - B. Even small changes in price, will greatly affect the quantity this consumer buys.
  - C. The consumer has high income.
  - D. The good is inferior.
11. An economist wants to model a market where 4 firms have market shares of 36%, 25%, 24%, and 15%. To simplify the model, he assumes that there are 4 identical firms with 25% market share each. Which of the following concepts allows for such a simplification? [4pts]
- A. The post-hoc-propter-ergo-hoc fallacy.
  - B. The fallacy of composition.
  - C. The ceteris-paribus principle.
  - D. None of the above.

12. William left a job where he was making 2,500 dollars per month and now he works as a full time freelance house painter. The economic profit for William from his painting enterprise is 1,000 dollars per month. How much is the accounting profit of William's enterprise? [4pts]
- A. Around -1,500 dollars per month (negative).
  - B. Around -1,000 dollars per month (negative).
  - C. Around 1,000 dollars per month.
  - D. Around 1,500 dollars per month.
  - E. Around 2,500 dollars per month.
  - F. Around 3,500 dollars per month.
13. The market of cigarettes is perfectly complete with a positively sloped market supply and a negatively sloped market demand. The government implements a 2-dollar tax on each pack of cigarettes. Which of the following is the most likely outcome? [4pts]
- A. The price of cigarettes will increase by more than 2 dollars.
  - B. The price of cigarettes will increase by exactly 2 dollars.
  - C. The price of cigarettes will increase by less than 2 dollars.
  - D. The price of cigarettes will not be affected.
  - E. Any of the above can happen.

### Problem A

14. According to scenario A, what price will the monopolist charge to maximize profits? [4pts]
- A. Around 10 dollars.
  - B. Around 20 dollars.
  - C. Around 30 dollars.
  - D. Around 40 dollars.
  - E. Around 50 dollars.
  - F. Around 60 dollars.
15. According to scenario A, a regulator implements a price ceiling of 10 dollars. Which of the following best describes the effect of the price ceiling on the dead weight loss in this market? [4pts]
- A. The price ceiling will cause the dead weight loss to increase.
  - B. The price ceiling will cause the dead weight loss to decrease.
  - C. The price ceiling will eliminate the dead weight loss completely.
  - D. The price ceiling will not affect the dead weight loss.

### Problem B

*[Scenario B] A market is served by two identical firms with  $MC = 100$  and zero fixed costs. The firms compete with respect to quantities. The market demand is  $p = 700 - 2Q$ .*

16. Based on scenario B, what will be the total quantity that both firms together will sell in the market? [4pts]
- A. Around 100 units by both firms together.
  - B. Around 125 units by both firms together.
  - C. Around 150 units by both firms together.
  - D. Around 175 units by both firms together.
  - E. Around 200 units by both firms together.
  - F. Around 225 units by both firms together.

17. Based on scenario B, what will be the total quantity that will be sold in the market by the two firms together, if they fix the price at the monopoly level? [4pts]
- A. Around 100 units by both firms together.
  - B. Around 125 units by both firms together.
  - C. Around 150 units by both firms together.
  - D. Around 175 units by both firms together.
  - E. Around 200 units by both firms together.
  - F. Around 225 units by both firms together.
18. Based on scenario B, what will be the total quantity sold in the market if one of the firms sticks to the price fixing agreement to charge the monopoly price but the other firm cheats? [4pts]
- A. Around 115 units by both firms together.
  - B. Around 130 units by both firms together.
  - C. Around 145 units by both firms together.
  - D. Around 160 units by both firms together.
  - E. Around 175 units by both firms together.
  - F. Around 190 units by both firms together.

## Short Answer Tasks

Answer the following questions in no more than 80 words.

19. Explain how advertisement can serve as a method of rent seeking *[2 points penalty for exceeding 80 words]*. [4pts]
20. List the reasons that can lead production to Economies of Scale. {Hint: Do not define or explain them, just list them like: i. This reason. ii. The other reason. iii. A third reason etc.}. *[2 points penalty for exceeding 80 words]* [4pts]
21. Explain how product differentiation can increase the market power for a monopolistically competitive firm *[2 points penalty for exceeding 80 words]*. [4pts]
22. Fiat corporation manufactures and sells two different brands of cars: Fiat cars and Alfa Romeo cars. The corporation also supplies parts for both of its brands but other manufacturers sell parts of indistinguishable quality, too. The unit cost of making parts for Fiat cars and Alfa Romeo cars is very similar. Moreover, the demand for Fiat parts is way higher than the demand for Alfa Romeo parts, because every year, millions of Fiat cars are sold, while only a few thousand Alfa Romeo cars hit the market. Yet, parts for Alfa Romeo cars are much more expensive than parts for Fiat cars. Why? *[2 points penalty for exceeding 80 words]* [4pts]

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END OF TEST

## Midterm Test – KEY

October 2020

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. Which of the following markets should be expected to yield a dead weight loss? [4pts]
  - A. **A non-collusive oligopoly where sellers compete with respect to quantity.** [ $P > MC$ ,  $DWL > 0$ ]
  - B. A natural monopoly regulated for efficiency. [ $P = MC$ , no  $DWL$ ]
  - C. A perfectly competitive market which is profitable in the short-run period. [ $P = MC$ , no  $DWL$ ]
  - D. All of the above will produce a dead weight loss.
  - E. None of the above will produce a dead weight loss.
  
2. Which of the following can be described as a positive externality failure? [4pts]
  - A. Fruits and vegetables are healthy but they are too expensive for Peter to buy a sufficient quantity of those to benefit his health. [*There is no externality*]
  - B. **Electric vehicles are environmentally friendly but they are too expensive for Singaporeans to be able to afford to buy a sufficient number of those for the environment to benefit.** [*A positive externality that does not occur*]
  - C. The gardener uses a noisy leaf-blower machine to clean the yard faster instead of a broom that would take him longer to do the cleaning but without bothering the block's residents. [*This is a negative externality*]
  - D. All of the above.
  
3. Which of the following situations would be suitable for an economist to use the kinked-demand model? [4pts]
  - A. In an oligopoly where no collusion is established and competition is intense.
  - B. In an oligopoly where no collusion is established and competition is not intense.
  - C. **In an oligopoly where collusion is established but sellers do not trust each-other.**
  - D. In an oligopoly where collusion is established and sellers trust each-other.

*[The kinked demand model assumes that prices are implicitly or explicitly set at the "prevailing level". Otherwise, firms would have no reservation for dropping the price every time market conditions warrant a price decrease. Also, if there was trust, a unilateral price decrease would not carry the risk of being misinterpreted as an attempt to undercut]*
  
4. Which of the following will happen to a Cournot duopoly like the one we presented in the lecture, if a regulator decides to completely lift the barriers to entry in the industry? [4pts]
  - A. Average costs will be decreased.
  - B. Fixed costs only will be decreased.
  - C. Profits will be eliminated.
  - D. **Profits will be eliminated only in the long-run period.**

*[As we clearly repeated many times in the lecture, the existence of barriers has to do with limitation of entry in the L-R period. If barriers are lifted, firms will start entering till L-R profit vanish]*

5. Which of the following monopolists will most likely have the lowest market power? [4pts]
- A monopolist who faces a near totally inelastic demand curve.
  - A monopolist who faces a near totally elastic demand curve.**
  - A monopolist who faces a U-shaped AC curve.
  - A monopolist who faces a horizontal AC curve.
- [Market power is not related to AC but to the distance of price from MC. The more elastic the demand, the closer the distance of price and MC, and thus, the lower the market power]*
6. Last year, Anastasia decided to buy a Netflix subscription. Yesterday, Netflix announced a price increase, so from this month, Anastasia has to pay 1 dollar more per month if she wants to keep watching Netflix. Which of the following is certain? [4pts]
- Anastasia will stop her subscription. *[Possible but not certain]*
  - Anastasia will get Netflix for fewer months. *[Possible but not certain]*
  - Anastasia's consumer surplus will decrease.** *[Anastasia's demand did not change, thus, an increase in price will certainly decrease the area between her demand and price]*
  - Anastasia will subscribe to a complete streaming service. *[Possible but not certain]*
7. Jack owns an airport shuttle service. He employs a driver for 100 dollars per day and has leased a minivan for two years for 50 dollars per day. The minivan executes 10 trips to the airport daily for a revenue 25 dollars per trip. The cost of fuel for each trip is 12 dollars. Which of the following is the best option for Jack? [4pts]
- Jack should keep operating the service indefinitely by renewing the minivan lease when it expires.
  - Jack should shut down the service immediately to avoid losses.
  - Jack should shut down the service after the minivan lease expires.**
  - Jack should reduce the amount of daily rides to bring his profit up.
- [Jack's daily revenue is  $10 \cdot 25 = 250$  dollars. Jack's daily cost is  $100 + 50 + 10 \cdot 12 = 270$  dollars. Jack has a loss of 20 dollars per day. Still, Jack's variable cost is  $100/10 + 12 = 22$  dollars per ride, which is completely covered by the 25 dollars he is paid per ride. Thus, Jack should operate till the lease expires because by operating, he can cover 20 out of the 50 dollars for the lease. If he shuts down, he will have to pay all 50 dollars for the lease from his pocket]*
8. Joanna is a freelance photographer, who takes on average 1 job per day. Joanna has leased her equipment for three years for 20 dollars per day, and she also employs her brother Fred as an assistant for 70 dollars per job. Which of the following will occur if Fred is given a raise and he is now paid 80 dollars per job? [4pts]
- Joanna's FC will increase.
  - Joanna's VC will increase.**
  - Both of the above.
  - None of the above.
- [Fred is clearly paid by the job. This means that when there are no jobs, Fred is receiving no payment. Thus, Fred is a variable cost as far as Joanna's business is concerned]*
9. Which of the following is consistent with a budget constraint line, which starts from 20 burgers on the vertical axis, and ends at 10 beers on the horizontal axis? [4pts]
- The price of burgers is equal to the price of beer.
  - The price of burgers exceeds the price of beer.
  - The price of burgers is lower than the price of beer.**
  - All of the above could be consistent with this budget line.

*[With the same budget you can buy either 20 burgers or 10 beers. This means that a beer costs double than a burger]*

10. Which of the following is consistent with a nearly vertical demand curve by a consumer? [4pts]

- A. **Even large changes in price, will not affect the quantity this consumer buys.**
- B. Even small changes in price, will greatly affect the quantity this consumer buys.
- C. The consumer has high income.
- D. The good is inferior.

*[When the demand curve is nearly vertical, it means that quantity is pretty much fixed. Thus, changes in price do not cause quantity to change by much]*

11. An economist wants to model a market where 4 firms have market shares of 36%, 25%, 24%, and 15%. To simplify the model, he assumes that there are 4 identical firms with 25% market share each. Which of the following concepts allows for such a simplification? [4pts]

- A. The post-hoc-propter-ergo-hoc fallacy.
- B. The fallacy of composition.
- C. The ceteris-paribus principle.
- D. **None of the above.**

*[The question clearly describes the 'representative agent' concept]*

12. William left a job where he was making 2,500 dollars per month and now he works as a full time freelance house painter. The economic profit for William from his painting enterprise is 1,000 dollars per month. How much is the accounting profit of William's enterprise? [4pts]

- A. Around -1,500 dollars per month (negative).
- B. Around -1,000 dollars per month (negative).
- C. Around 1,000 dollars per month.
- D. Around 1,500 dollars per month.
- E. Around 2,500 dollars per month.
- F. **Around 3,500 dollars per month.**

*[We have: Economic Profit = Accounting profit - OC or 1,000 =  
Accounting profit - 2,500 or Accounting profit = 3,500]*

13. The market of cigarettes is perfectly complete with a positively sloped market supply and a negatively sloped market demand. The government implements a 2-dollar tax on each pack of cigarettes. Which of the following is the most likely outcome? [4pts]

- A. The price of cigarettes will increase by more than 2 dollars.
- B. The price of cigarettes will increase by exactly 2 dollars.
- C. **The price of cigarettes will increase by less than 2 dollars.**
- D. The price of cigarettes will not be affected.
- E. Any of the above can happen.

*[This is a straight-out-of-video question on taxation in a PC market as presented in tutorial video 4. The tax burden will be split between consumers and producers. Thus, consumers will be burdened by less than the total value of the tax]*

## Problem A

[Scenario A] A monopolist faces demand  $p = 100 - Q$ , has marginal cost equal to 4 and zero fixed costs.

14. According to scenario A, what price will the monopolist charge to maximize profits? [4pts]

- A. Around 10 dollars.
- B. Around 20 dollars.
- C. Around 30 dollars.
- D. Around 40 dollars.
- E. Around 50 dollars.**
- F. Around 60 dollars.

[ $MR = 100 - 2Q$ . Then  $MR = MC$  entails  $100 - 2Q = 4$  or  $2Q = 96$  or  $Q = 48$ ]

15. According to scenario A, a regulator implements a price ceiling of 10 dollars. Which of the following best describes the effect of the price ceiling on the dead weight loss in this market? [4pts]

- A. The price ceiling will cause the dead weight loss to increase.
- B. The price ceiling will cause the dead weight loss to decrease.**
- C. The price ceiling will eliminate the dead weight loss completely.
- D. The price ceiling will not affect the dead weight loss.

[For  $Q = 48$  the monopoly will want to price at  $p = 100 - 48$  or  $p = 52$ . The price for a zero DWL would be  $p = MC$  or  $p = 4$ . The regulated price ceiling of 10 is in between the two. Thus, the price ceiling will reduce the DWL but not eliminate it]

## Problem B

[Scenario B] A market is served by two identical firms with  $MC = 100$  and zero fixed costs. The firms compete with respect to quantities. The market demand is  $p = 700 - 2Q$ .

16. Based on scenario B, what will be the total quantity that both firms together will sell in the market? [4pts]

- A. Around 100 units by both firms together.
- B. Around 125 units by both firms together.
- C. Around 150 units by both firms together.
- D. Around 175 units by both firms together.
- E. Around 200 units by both firms together.**
- F. Around 225 units by both firms together.

[MR for firm 1 is  $MR_1 = 700 - 2q_2 - 4q_1$ . Firm 1 maximizes profit when  $MR_1 = MC$  or  $700 - 2q_2 - 4q_1 = 100$  or  $4q_1 = 600 - 2q_2$  or  $q_1 = 150 - 0.5q_2$ . We know that the two firms are identical and that in the end  $q_1 = q_2$ . Thus, we can write:  $q_1 = 150 - 0.5q_1$  or  $1.5q_1 = 150$  or  $q_1 = q_2 = 100$ . Thus,  $q_1 + q_2 = 200$ ]

17. Based on scenario B, what will be the total quantity that will be sold in the market by the two firms together, if they fix the price at the monopoly level? [4pts]

- A. Around 100 units by both firms together.
- B. Around 125 units by both firms together.
- C. Around 150 units by both firms together.**
- D. Around 175 units by both firms together.
- E. Around 200 units by both firms together.
- F. Around 225 units by both firms together.

[The MR for the cartel would be:  $MR = 700 - 4Q$ . Profit is maximum when  $700 - 4Q = 100$  or  $Q = 150$ ]



18. Based on scenario B, what will be the total quantity sold in the market if one of the firms sticks to the price fixing agreement to charge the monopoly price but the other firm cheats? [4pts]
- Around 115 units by both firms together.
  - Around 130 units by both firms together.
  - Around 145 units by both firms together.
  - Around 160 units by both firms together.
  - Around 175 units by both firms together.
  - Around 190 units by both firms together.**

*[The firm who would stick to the agreement (say firm 2) would sell  $q_2 = 150/2$  or  $q_2 = 75$ . The firm who would cheat (say firm 1), would produce the quantity that maximizes its profit given that the other firm produces 75 units. From the optimal response that we derived above:  $q_1 = 150 - 0.5q_2$  or  $q_1 = 150 - 0.5 \cdot 75$  or  $q_1 = 112.5$ . Thus,  $q_1 + q_2 = 112.5 + 75 = 187.5$ ]*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

19. Explain how advertisement can serve as a method of rent seeking *[2 points penalty for exceeding 80 words]*. [4pts]

*Advertisement can function as a rent-seeking mechanism when instead of being used to inform consumer about the product, it is used to artificially raise the standards of advertisement in the industry making it harder for potential competitors to enter the industry. [41 words]*

20. List the reasons that can lead production to Economies of Scale. {Hint: Do not define or explain them, just list them like: i. This reason. ii. The other reason. iii. A third reason etc.}. *[2 points penalty for exceeding 80 words]* [4pts]

- Labor specialization.
- Quantity discounts.
- Can do things that can be done only at a large scale.
- Take advantage of the law of averages to handle risk more efficiently.
- Natural reasons like the square-cube law. [39 words]

21. Explain how product differentiation can increase the market power for a monopolistically competitive firm *[2 points penalty for exceeding 80 words]*. [4pts]

*Market power is the ability to charge a price above marginal cost (MC). When the product of one firm is perceived as different by the consumers, it is harder for the consumers to substitute it with competitive products and they become willing to tolerate a price above MC. (48 words)*

*ALTERNATIVE ANSWER: Graphically, the more differentiated a product is from the competitive products, the steeper the demand curve will be for the seller, allowing the vertical distance from the 'MR=MC point' and the demand to be larger and yielding a higher price. [40 words]*

22. Fiat corporation manufactures and sells two different brands of cars: Fiat cars and Alfa Romeo cars. The corporation also supplies parts for both of its brands but other manufacturers sell parts of indistinguishable quality, too. The unit cost of making parts for Fiat cars and Alfa Romeo cars is very similar. Moreover, the demand for Fiat parts is way higher than the demand for Alfa Romeo parts, because every year, millions of Fiat cars are sold, while only a few thousand Alfa Romeo cars hit the market. Yet, parts for Alfa Romeo cars are much more expensive than parts for Fiat cars. Why? *[2 points penalty for exceeding 80 words]* [4pts]

*3 reasons: First, since more Fiat cars are sold, more Fiat parts must be produced allowing their manufacturers to enjoy better EoS than for Alfa Romeo. Second, Fiat parts may be sold in PC markets with no market power (because sellers can be many); while Alfa Romeo parts may be sold in Oligopolistic markets with significant market power (because sellers will be less). Third, Alfa Romeo owners could be willing to tolerate higher part prices because of higher incomes. [79 words]*

*[Some observations: (i) 40% of the students in this question failed to even comprehend that the question was about parts, not about cars (seriously?!). (ii) Fiat and Alfa Romeo parts are not substitutes, complements, inferior or anything of those. The markets are completely independent: If you own a Fiat, you buy parts for Fiat; If you own an Alfa Romeo, you buy parts for Alfa Romeo. (iii) The question clearly mentions that there are third party manufacturers for both Fiat and Alfa Romeo parts. Thus, "Fiat restricts production to do [...]" did not make any sense because Fiat is not alone in the market of parts. (iv) The fact that unit costs are similar does not necessarily mean that different quantities will not result to different EoS. (v) The question did not require you to know anything above and beyond for cars, brands, parts etc. than what was given in the question. If you wrote 1 reason you got up to 4 points if you wrote 2 reasons up to 7 points. No one wrote all 3 reasons]*

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END OF TEST

## Final EXAM

April 2020

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. Which of the following alternative situations describes a positive externality? [4pts]
  - A. My dad spends one hour reading the newspaper for his own satisfaction and my mom enjoys one hour of quiet.
  - B. My dad spends one hour reading the newspaper for his own satisfaction and my mom is bothered by him having the light on during the time she is trying to sleep.
  - C. My dad spends one hour reading the newspaper for his own satisfaction and later on he uses the coupon that he found in the newspaper to save 3 euros when changing the oil in his car.
  - D. All of the above describe a positive externality.
2. When the market of firfirikia is in L-R equilibrium, the average cost is 40 cents. However, if even more firfirikia are produced the average cost can drop to 35 cents. Which of the following is accurate? [4pts]
  - A. Firfirikia is a perfectly competitive good.
  - B. Firfirikia is a monopolistically competitive good.
  - C. Both of the above can potentially be accurate.
  - D. None of the above can be potentially accurate.
3. Which of the following is NOT accurate for expansionary fiscal policy through government spending? [4pts]
  - A. It will increase GDP provided that the labor market operates below capacity.
  - B. It will increase the budget deficit or decrease the budget surplus.
  - C. It will decrease household consumption.
  - D. It will not affect the interest rate if it is accommodated by the Central Bank.
4. Which of the following is accurate for a collusive market? [4pts]
  - A. Each of its members will face a strong incentive for cheating.
  - B. Each of its members will enjoy a higher long-run profit compared to the case where collusion is not established.
  - C. Both of the above are accurate.
  - D. None of the above is accurate.
5. Which of the following is accurate regarding Open Market Sales by a Central Bank? [4pts]
  - A. They decrease the money supply.
  - B. They increase the money demand.
  - C. Both of the above are accurate.
  - D. None of the above is accurate.

6. In an economy, households save the 50% of their yearly income which is \$30K. In this economy firms own capital valued at \$12K, which depreciates at a rate of 25% per year. Next year, the households of this economy will have [4pts]
- a higher income.
  - a lower income.
  - the same income.
  - all of the above are possible.
7. Which of the following is required for the diversification of loans to reduce the risk for the creditor? [4pts]
- The number of loans that will be given must be as small as possible.
  - The creditors' probabilities of default must not all be affected by a factor common for all debtors.
  - The creditor must loan out to those debtors that have a significant probability of default.
  - All of the above are required.
8. Which of the following markets is possible to yield a profit for the firms in the long-run period? [4pts]
- A perfectly competitive market.
  - A Bertrand oligopoly.
  - A Cournot oligopoly.
  - A monopolistically competitive market.
9. The demand curve in a market is  $p = 10 - q$  and the equilibrium quantity is 6. How much is the consumer surplus? [4pts]
- Around 9.
  - Around 18.
  - Around 27.
  - Around 36.
10. A taxi firm has leased 3 cars for two years. The firm also used to employ 3 drivers, none of which was on a contract. Last month, because of high demand for taxi services, the firm hired another 3 drivers to work a second shift on the cars. After the additional drivers were hired, the owner of the firm noticed that the cost per km increased as cars started needing more maintenance because of the over-utilization. Which of the following is accurate? [4pts]
- The firm experiences increasing returns.
  - The firm experiences Diminishing returns.
  - The firm experiences economies of scale.
  - The firm experiences diseconomies of scale.
11. Peter's utility from consuming 0 slices of cheesecake per day is 0. Peter's marginal utility from the first slice is 4; from the second slice is 2; from the third slice is 1; from the fourth slice is -1; and from the fifth slice is -4. Which of the following is accurate? [4pts]
- Peter's optimal consumption of cheesecake per day is 4 slices.
  - Peter would prefer consuming zero slices of cheesecake per day rather than consuming 5 slices per day.
  - Both of the above are accurate.
  - None of the above is accurate.
12. A Singaporean consumer orders a vacuum cleaner from China for \$40. The seller pays a Singaporean company \$5 dollars for the online sale and the delivery. How is this transaction going to affect the Singapore's national income accounts of expenditure? [4pts]

- A. Production will be increased by the \$5 worth of services the Singaporean company produced.
  - B. Imports will increase by \$35 and consumption will increase by \$40.
  - C. The income of the Singaporean company will increase by \$5.
  - D. Singapore's expenditure will not be affected.
13. Stavros owns a store of motorbike accessories in Athens, from which he earns on average \$2,500 dollars per month. Stavros, also, owns the real estate space where his store is located, thus he does not pay rent to himself. According to a market estimate, a space such as his could easily be rented out for around \$3,000 per month. How much is the monthly economic profit for Stavros? [4pts]
- A. -\$500
  - B. \$2,500
  - C. \$3,000
  - D. \$5,500

### PROBLEM A

*[Scenario A] Consider a Cournot duopoly between firm 1 and firm 2. Both firms have constant average costs equal to 10 and they both face the market demand  $p = 100 - Q$*

14. According to scenario A, how much is the profit maximizing quantity for each firm? [4pts]
- A. Around 1.
  - B. Around 3.
  - C. Around 10.
  - D. Around 20.
  - E. Around 30.
  - F. Around 45.
  - G. Around 60.
  - H. Around 90.
15. According to scenario A, how much is the total profit maximizing quantity in the market, if the two firms collude? [4pts]
- A. Around 1.
  - B. Around 3.
  - C. Around 10.
  - D. Around 20.
  - E. Around 30.
  - F. Around 45.
  - G. Around 60.
16. According to scenario A, how much is the total profit maximizing quantity in the market, if the two firms start competing with respect to price instead of quantity? [4pts]
- A. Around 1.
  - B. Around 3.
  - C. Around 10.
  - D. Around 20.
  - E. Around 30.
  - F. Around 45.
  - G. Around 60.
  - H. Around 90.

## PROBLEM B

[Scenario B] An economy is completely isolated from the outside world and has no government. The basic minimum level of consumption is 5 units and the marginal propensity of consumption is 0.75. The private investment is 10 units.

17. According to scenario B, find the equilibrium GDP in this economy. [4pts]
- A. Around 10 units.
  - B. Around 20 units.
  - C. Around 30 units.
  - D. Around 40 units.
  - E. Around 50 units.
  - F. Around 60 units.
  - G. Around 70 units.
  - H. Around 80 units.
18. According to scenario B, find the equilibrium household consumption in this economy. [4pts]
- A. Around 10 units.
  - B. Around 20 units.
  - C. Around 30 units.
  - D. Around 40 units.
  - E. Around 50 units.
  - F. Around 60 units.
  - G. Around 70 units.
  - H. Around 80 units.

## Short Answer Tasks

Answer the following questions in no more than 80 words.

19. A conservative commentator recently voiced the following opinion: "Governments should not tax cigarettes more than other goods. If people want to spend their money on a known carcinogen, why should the rest of us try to prevent them from doing it? Let everyone make their choices and let them deal with the consequences of their own stupidity". Use economic argument(s) to support or oppose this opinion. **[2 points penalty for exceeding 80 words]** [7pts]
20. During the Covid-19 crisis, a significant fall in demand for consumption and private investment has been observed. Currently, there is a consensus that economies around the world will soon enter a state of recession. As a response to this crisis, almost all economists advocate for the necessity of expansionary policy. In no more than 80 words, argue which policy you would recommend: monetary or fiscal? **[2 points penalty for exceeding 80 words]** [7pts]
21. In the lecture, we explained that social policies such as the minimum wage law have winners and losers. In no more than 80 words, explain who are the losers of the minimum wage law. **[2 points penalty for exceeding 80 words]** [7pts]
22. For the last century, around the world, we observe that wealthy nations usually exhibit lower growth rates than some poorer nations. Use the appropriate model and terminology from the course to explain in no more than 80 words why this is the case. **[2 points penalty for exceeding 80 words]** [7pts]

## Final EXAM - KEY

April 2020

### Multiple Choice Tasks

Select the answer that most closely answers the question.

- Which of the following alternative situations describes a positive externality? [4pts]
  - My dad spends one hour reading the newspaper for his own satisfaction and my mom enjoys one hour of quiet.** *[This is a positive spillover from my dad to my mom]*
  - My dad spends one hour reading the newspaper for his own satisfaction and my mom is bothered by him having the light on during the time she is trying to sleep. *[This is a negative spillover from my dad to my mom]*
  - My dad spends one hour reading the newspaper for his own satisfaction and later on he uses the coupon that he found in the newspaper to save 3 euros when changing the oil in his car. *[Here there is no spillover]*
  - All of the above describe a positive externality.
- When the market of firfirikia is in L-R equilibrium, the average cost is 40 cents. However, if even more firfirikia are produced the average cost can drop to 35 cents. Which of the following is accurate? [4pts]
  - Firfirikia is a perfectly competitive good.
  - Firfirikia is a monopolistically competitive good.**
  - Both of the above can potentially be accurate.
  - None of the above can be potentially accurate.

*[Since AC is not minimized at the L-R equilibrium, this cannot be a PC market. Given that the AC is minimized for higher quantity than the equilibrium, we can conclude that it is possible that this market is a monopolistically competitive market]*
- Which of the following is NOT accurate for expansionary fiscal policy through government spending? [4pts]
  - It will increase GDP provided that the labor market operates below capacity. *[True]*
  - It will increase the budget deficit or decrease the budget surplus. *[True]*
  - It will decrease household consumption.** *[It will increase C because Y will increase]*
  - It will not affect the interest rate if it is accommodated by the Central Bank. *[True]*
- Which of the following is accurate for a collusive market? [4pts]
  - Each of its members will face a strong incentive for cheating. *[True]*
  - Each of its members will enjoy a higher long-run profit compared to the case where collusion is not established. *[True]*
  - Both of the above are accurate.**
  - None of the above is accurate.
- Which of the following is accurate regarding Open Market Sales by a Central Bank? [4pts]
  - They decrease the money supply.** *[CB sells securities, collecting M1 money, so money supply decreases]*
  - They increase the money demand. *[Money demand is not affected by the CB]*

- C. Both of the above are accurate.
- D. None of the above is accurate.

6. In an economy, households save the 50% of their yearly income which is \$30K. In this economy firms own capital valued at \$12K, which depreciates at a rate of 25% per year. Next year, the households of this economy will have [4pts]

- A. a higher income.**
- B. a lower income.
- C. the same income.
- D. all of the above are possible.

*[Investment next year will be  $0.5 \cdot 30K = 15K$  and depreciation will be  $0.25 \cdot 12K = 3K$ .  
Investment exceeds depreciation; thus, income next year will be higher]*

7. Which of the following is required for the diversification of loans to reduce the risk for the creditor? [4pts]

- A. The number of loans that will be given must be as small as possible.
- B. The creditors' probabilities of default must not all be affected by a factor common for all debtors.**
- C. The creditor must loan out to those debtors that have a significant probability of default.
- D. All of the above are required.

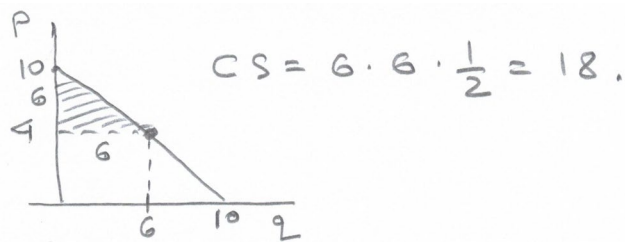
*[Diversification is simply "put your eggs in several baskets". If some event makes all baskets to fall, diversification will not have a result. For instance, if all baskets are on the same tray and the dog hits the tray, all eggs will break, regardless of being diversified in different baskets]*

8. Which of the following markets is possible to yield a profit for the firms in the long-run period? [4pts]

- A. A perfectly competitive market. *[No L-R profit]*
- B. A Bertrand oligopoly. *[No profit]*
- C. A Cournot oligopoly.**
- D. A monopolistically competitive market. *[No L-R profit]*

9. The demand curve in a market is  $p = 10 - q$  and the equilibrium quantity is 6. How much is the consumer surplus? [4pts]

- A. Around 9.
- B. Around 18.**
- C. Around 27.
- D. Around 36.



10. A taxi firm has leased 3 cars for two years. The firm also used to employ 3 drivers, none of which was on a contract. Last month, because of high demand for taxi services, the firm hired another 3 drivers to work a second shift on the cars. After the additional drivers were hired, the owner of the firm noticed that the cost per km increased as cars started needing more maintenance because of the over-utilization. Which of the following is accurate? [4pts]

- A. The firm experiences increasing returns.
- B. The firm experiences Diminishing returns. *[S-R AC is increasing]***
- C. The firm experiences economies of scale. *[Impossible because we have a fixed factor (cars), thus we are in the short-run period]*
- D. The firm experiences diseconomies of scale. *[Same as above]*

11. Peter's utility from consuming 0 slices of cheesecake per day is 0. Peter's marginal utility from the first slice is 4; from the second slice is 2; from the third slice is 1; from the fourth slice is -1; and from the fifth slice is -4. Which of the following is accurate? [4pts]



- A. Peter's optimal consumption of cheesecake per day is 4 slices. *[Wrong, it is 3 slices, where utility is maximized at 7 units]*
- B. Peter would prefer consuming zero slices of cheesecake per day rather than consuming 5 slices per day. *[Wrong, with 0 slices utility is 0; with 5 slices, utility is 2]*
- C. Both of the above are accurate.
- D. None of the above is accurate.

Slices	0	1	2	3	4	5
U	0	4	6	7	6	2
MU	N/A	4	2	1	-1	-4

12. A Singaporean consumer orders a vacuum cleaner from China for \$40. The seller pays a Singaporean company \$5 dollars for the online sale and the delivery. How is this transaction going to affect the Singapore's national income accounts of expenditure? [4pts]
- A. Production will be increased by the \$5 worth of services the Singaporean company produced. *[Correct but does not pertain to expenditure]*
- B. Imports will increase by \$35 and consumption will increase by \$40.**
- C. The income of the Singaporean company will increase by \$5. *[Correct but does not pertain to expenditure]*
- D. Singapore's expenditure will not be affected. *[Wrong]*  
*The components of expenditure are  $C + I + G + (X - M)$ . C will increase by 40 dollars. I, G and X will not be affected. M will increase by 35 dollars (because the value of the item is 35 dollars as 5 dollars are paid for the shipping). Thus, the overall effect on expenditure is  $40 - 35 = 5$  dollars]*
13. Stavros owns a store of motorbike accessories in Athens, from which he earns on average \$2,500 dollars per month. Stavros, also, owns the real estate space where his store is located, thus he does not pay rent to himself. According to a market estimate, a space such as his could easily be rented out for around \$3,000 per month. How much is the monthly economic profit for Stavros? [4pts]
- A. **-\$500**
- B. \$2,500
- C. \$3,000
- D. \$5,500
- [Stavros' accounting profit is \$2,500 and his opportunity cost is \$3,000, thus his economic profit is -\$500]*

## PROBLEM A

*[Scenario A] Consider a Cournot duopoly between firm 1 and firm 2. Both firms have constant average costs equal to 10 and they both face the market demand  $p = 100 - Q$*

14. According to scenario A, how much is the profit maximizing quantity for each firm? [4pts]
- A. Around 1.
- B. Around 3.
- C. Around 10.
- D. Around 20.
- E. Around 30.**
- F. Around 45.
- G. Around 60.
- H. Around 90.

The demand can be written as  $p = 100 - q_1 - q_2$ . The marginal revenue for firm 1 is  $MR_1 = 100 - q_2 - 2q_1$ . Now, we set  $MR_1 = MC$  or  $100 - q_2 - 2q_1 = 10$ . Because firms are identical and symmetric, we can assume that  $q_1 = q_2$ . Thus, we can modify the previous equation as  $100 - q_1 - 2q_1 = 10$  or  $3q_1 = 90$  or  $q_1 = q_2 = 30$ .

15. According to scenario A, how much is the total profit maximizing quantity in the market, if the two firms collude? [4pts]

- A. Around 1.
- B. Around 3.
- C. Around 10.
- D. Around 20.
- E. Around 30.
- F. Around 45.**
- G. Around 60.

If the firms collude, they will exploit the market as a monopoly, thus  $MR = 100 - 2Q$ . We set  $MR = MC$  or  $100 - 2Q = 10$  or  $Q = 45$ .

16. According to scenario A, how much is the total profit maximizing quantity in the market, if the two firms start competing with respect to price instead of quantity? [4pts]

- A. Around 1.
- B. Around 3.
- C. Around 10.
- D. Around 20.
- E. Around 30.
- F. Around 45.
- G. Around 60.
- H. Around 90.**

If firms start competing in a Bertrand manner,  $p = MC$  or  $p = 10$ . From the market demand  $p = 100 - Q$  or  $10 = 100 - Q$  or  $Q = 90$ .

## PROBLEM B

[Scenario B] An economy is completely isolated from the outside world and has no government. The basic minimum level of consumption is 5 units and the marginal propensity of consumption is 0.75. The private investment is 10 units.

17. According to scenario B, find the equilibrium GDP in this economy. [4pts]

- A. Around 10 units.
- B. Around 20 units.
- C. Around 30 units.
- D. Around 40 units.
- E. Around 50 units.
- F. Around 60 units.**
- G. Around 70 units.
- H. Around 80 units.

The consumption function is  $C = 5 + 0.75Y$  (no government – no taxes). Then,  $Y = C + I + G$  or  $Y = 5 + 0.75Y + 10 + 0$  or  $0.25Y = 15$  or  $Y = 60$ .

18. According to scenario B, find the equilibrium household consumption in this economy. [4pts]

- A. Around 10 units.
- B. Around 20 units.
- C. Around 30 units.
- D. Around 40 units.
- E. Around 50 units.**
- F. Around 60 units.
- G. Around 70 units.
- H. Around 80 units.

*Using the consumption function  $C = 5 + 0.75 \cdot 60 = 50$ .*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

19. A conservative commentator recently voiced the following opinion: "Governments should not tax cigarettes more than other goods. If people want to spend their money on a known carcinogen, why should the rest of us try to prevent them from doing it? Let everyone make their choices and let them deal with the consequences of their own stupidity". Use economic argument(s) to support or oppose this opinion. **[2 points penalty for exceeding 80 words]** [7pts]

*This opinion is not economically justified because it fails to take into account the negative externality of smoking. Someone who smokes, has more chances to need the national health system depriving beds from the rest of the population, or more chances to die early living their family in need of social support that the taxpayers will have to pay. Taxing cigarettes reduces the externality benefiting society. [66 words]*

20. During the Covid-19 crisis, a significant fall in demand for consumption and private investment has been observed. Currently, there is a consensus that economies around the world will soon enter a state of recession. As a response to this crisis, almost all economists advocate for the necessity of expansionary policy. In no more than 80 words, argue which policy you would recommend: monetary or fiscal? **[2 points penalty for exceeding 80 words]** [7pts]

*Expansionary fiscal policy will support the producers by increasing  $G$  to compensate for the decrease in  $C$  and  $I$ , helping the economy to maintain most of its GDP. The increase in  $G$  can be used to produce services for the citizens in order to curb the decrease in utility experienced from less consumption or create infrastructure for the firms to curb the decrease in  $I$ . [65 words]*

*[Alternative answer] Expansionary monetary policy can increase the quantity of money and transfer it to the citizens and firms in order to be able to maintain closer to their original level of  $C$  and  $I$ . If, however, the productive ability of the economy has been reduced, the money transfers may cause inflation. [50 words]*

21. In the lecture, we explained that social policies such as the minimum wage law have winners and losers. In no more than 80 words, explain who are the losers of the minimum wage law. **[2 points penalty for exceeding 80 words]** [7pts]

*There are 2 losers: first, the lower skilled workers who lose their jobs because firms cut the positions with lower VMPL than the minimum wage. Second, the firms who have to pay higher wage to some of the workers for the same services. [42 words]*

22. For the last century, around the world, we observe that wealthy nations usually exhibit lower growth rates than some poorer nations. Use the appropriate model and terminology from the course to explain in no more than 80 words why this is the case. *[2 points penalty for exceeding 80 words]* [7pts]

*We can explain this using the Solow model. Wealthy nations are closer to their steady-state, so they have less room for improvement and thus make smaller steps forward. Poor nations are usually far away from their steady-state and can use catch-up growth in order to grow faster. [49 words]*

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END OF EXAM

## Midterm Test

February 2020

There was **NO midterm test** this term because of the covid-19 crisis.

A test was never created.  
(If it was, I would have published it here).

## Final EXAM

November 2019

### Multiple Choice Tasks

Select the answer that most closely answers the question.

1. In 2012, Victoria had a house built for a total cost of \$1.4 million. In 2019, she *sold it* to Bryan for \$1.8 million. Bryan found this house through a realtor, who charged him a *commission* of \$0.1 million for facilitating the transaction. How did the sale of the house through the realtor affect the GDP of 2019? [4pts]
  - A. It did not affect the GDP.
  - B. It increased the GDP by \$0.1 million.
  - C. It increased the GDP by \$0.4 million.
  - D. It increased the GDP by \$0.5 million.
  - E. It increased the GDP by \$1.9 million.
2. Two economies currently have the same physical capital *depreciation rate*, the same *saving rate*, the same *technology* but *different amount of capital*. Which of the following is true according to the Solow model? [4pts]
  - A. Currently, the two economies must have *equal GDP*.
  - B. The two economies must have the same steady-state GDP.
  - C. The two economies must have the *same consumption*.
  - D. The two economies must be *growing* at the same *rate*.
  - E. The two economies must have the same *investment level*.
3. Consider an economy that is currently at the *steady-state*. Which of the following will make this economy *grow* according to the Solow model? [4pts]
  - A. An increase in the *saving rate*.
  - B. An increase in the *depreciation rate*.
  - C. An increase in *consumption*.
  - D. A decrease in *investment*.
  - E. A decrease in *technology*.
4. Assume that all commercial banks in a country come to an *agreement* to charge the *same high commissions* to all money transfers for their customers. Which *institution* may want to investigate such a policy? [4pts]
  - A. The Central Bank.
  - B. The Competition Authority.
  - C. The judicial system.
  - D. To government.
  - E. The Avengers.
5. Which of the following describes the channel through which shocks can be transmitted from the *money market* to the *market for output*? [4pts]
  - A. Shocks *cannot* be transmitted from the one market to the other.
  - B. Change in output affects money demand.

- C. Change in the *interest rate* affects *government spending*.
  - D. Change in the *money supply* affects *money demand*.
  - E. Change in the *interest rate* affects *investment*.
6. Which of the following describes the channel through which shocks can be transmitted from the *market for output* to the *money market*? [4pts]
- A. Shocks *cannot* be transmitted from the one market to the other.
  - B. Change in output affects *money demand*.
  - C. Change in *consumption* affects the *money supply*.
  - D. Change in *consumption* affects *investment*.
  - E. Change in the *interest rate* affects *investment*.
7. The Central Bank is going to *increase money supply* by 3%. Which of the following is accurate regarding *expected inflation* in this economy? [4pts]
- A. There will be more money in circulation, thus prices will increase, so inflation *should be expected*.
  - B. Inflation should be expected only if the growth rate of the economy is less than 3%.
  - C. Inflation should be expected only if the economy is *not* in the *liquidity trap*.
  - D. Inflation should be expected only if the economy has *high unemployment*.
  - E. Inflation should be expected only if *prices are not controlled* by the government.
8. In an economy there are 6 projects of \$100K each with *returns*: 6%, 5%, 5%, 4%, 3% and 1%. There are also 5 projects of 200K each with *returns*: 7%, 6%, 4%, 3% and 1%. Currently the total investment is \$1 million. What would be the *interest rate* if there is no shortage for investment funds in this economy? [4pts]
- A. 1.5%.
  - B. 2.5%.
  - C. 3.5%.
  - D. 4.5%.
  - E. 5.5%.
9. Which of the following cases is the best example of *frictional* unemployment? [4pts]
- A. An untrained individual who entered the labor force because he heard of *high efficiency wages* paid by some companies.
  - B. An academic who will not find a job till the beginning of the next academic year.
  - C. A 55-year-old who is *continuously rejected* for several job openings because of his *age*.
  - D. A manual worker for whom the *minimum wage* exceeds the value of his *potential production*.
  - E. An electrical engineer who does not have time to *arrange interviews* because of his *temporary job*.
10. In which of the following markets *more output* will be sold under the same market demand? [4pts]
- A. A *monopoly* market.
  - B. A *Cournot* duopoly.
  - C. A Cournot duopoly with *collusion*.
  - D. A Bertrand duopoly.
  - E. A *Monopolistically Competitive* market.
11. Which of the following is *NOT true* for a natural monopoly? [4pts]
- A. If a natural monopoly is broken into several smaller firms, production will be *more costly*.
  - B. If a natural monopoly is regulated to *price at MC*, it will produce the *perfectly competitive* quantity.

- C. If a natural monopoly is regulated to *price at AC*, it will not need to be *subsidized*.
- D. If a natural monopoly produces quantity at  $MC = MR$ , it will not induce a DWL to the market.
- E. If a natural monopoly *decreases price*, more *quantity* will be *demanded* by consumers.
12. Brenda used to be a math tutor earning 60 dollars an hour. Now, she makes and sells earrings. Each pair of earrings requires materials worth \$15 and it takes her 30 min to make. How much is her *economic profit per pair* if she sells each pair for \$45? [4pts]
- A. Zero.
- B. \$15.
- C. \$30.
- D. \$45.
- E. \$60.
13. In which of the following ways will a decrease in the *taxation coefficient* affect the equilibrium output? [4pts]
- A. By increasing consumption.
- B. By increasing taxation.
- C. By both of the above.
- D. By none of the above.

## PROBLEM A

[Scenario A] A market faces demand  $p = 10 - 2Q$ , while the marginal cost of production is  $MC = 2$ .

14. According to scenario A, if this market is populated by a large number of identical firms, what will be the price? [2pts]
15. According to scenario A, if the market is exploited by a single firm, at what price will this firm be selling? [2pts]
16. According to scenario A, for the market above, draw an (approximate) figure showing the DWL under monopoly and calculate the DWL. [4pts]

## PROBLEM B

[Scenario B] A closed economy (where  $X = M$ ) has consumption function  $C = 200 + 0.5(Y - T)$ . Private investment is 90, government spends 70 and taxes are calculated as 20% of income.

17. Find the equilibrium *output* for the economy in scenario B. [3pts]
18. Find the equilibrium *output* for the economy in scenario B if the government spending increases to 100. [3pts]

## PROBLEM C

[Scenario C] A firm produces *firfirikia*. The price of one *firfiriki* is 10 dollars. The firm has 3 machines. The production function of the firm is  $Q = 2 \cdot K \cdot \sqrt{L}$  where  $K$  is the number of machines,  $L$  is the number of workers and  $Q$  is the quantity of *firfirikia* produced. The wage per worker is 20 dollars. All values are per hour.

19. How many workers will the firm in scenario C *hire* to maximize its profit? {Hint:  $\sqrt{1} = 1$ ;  $\sqrt{2} \approx 1.41$ ;  $\sqrt{3} \approx 1.73$ ;  $\sqrt{4} = 2$ ;  $\sqrt{5} \approx 2.24$ ;  $\sqrt{6} \approx 2.45$ } [7pts]



## Short Answer Tasks

Answer the following questions in no more than 80 words.

20. Present and briefly explain one case where the economy exhibits inflation without increase in output. Name this particular kind of inflation and explain what exactly causes it. *[2 points penalty for exceeding 80 words]* [7pts]
21. Define the following terms 'Fiat money' and 'Physical capital depreciation'. {Hint: only definition, no explanation, no examples} *[2 points penalty for exceeding 80 words]* [6pts]
22. Briefly explain what economists mean when they say that 'collusion may not be a sustainable market outcome'. *[2 points penalty for exceeding 80 words]* [7pts]
23. Briefly explain how the Central Bank can set the interest rate. *[2 points penalty for exceeding 80 words]* [5pts]

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END OF EXAM

## Final EXAM – KEY

November 2019

### Multiple Choice Tasks

Select the answer that most closely answers the question.

- In 2012, Victoria had a house built for a total cost of \$1.4 million. In 2019, she *sold it* to Bryan for \$1.8 million. Bryan found this house through a realtor, who charged him a *commission* of \$0.1 million for facilitating the transaction. How did the sale of the house through the realtor affect the GDP of 2019? [4pts]
  - It did not affect the GDP.
  - It increased the GDP by \$0.1 million.**
  - It increased the GDP by \$0.4 million.
  - It increased the GDP by \$0.5 million.
  - It increased the GDP by \$1.9 million.

*[Only the service of the realtor was produced in 2019]*
- Two economies currently have the same physical capital *depreciation rate*, the same *saving rate*, the same *technology* but *different amount of capital*. Which of the following is true according to the Solow model? [4pts]
  - Currently, the two economies must have *equal GDP*. *[Not if they did not start at the same time]*
  - The two economies must have the same steady-state GDP.**
  - The two economies must have the *same consumption*. *[Not if they did not start at the same time]*
  - The two economies must be *growing* at the same rate. *[Not if they did not start at the same time]*
  - The two economies must have the same *investment level*. *[Not if they did not start at the same time]*
- Consider an economy that is currently at the *steady-state*. Which of the following will make this economy *grow* according to the Solow model? [4pts]
  - An increase in the saving rate.** *[Will increase the amount invested]*
  - An increase in the *depreciation rate*. *[Will increase the amount of capital lost to wear and tear]*
  - An increase in *consumption*. *[Will decrease the investment, ceteris paribus]*
  - A decrease in *investment*. *[Will decrease the productive ability of the economy]*
  - A decrease in *technology*. *[Will decrease the productive ability of the economy]*
- Assume that all commercial banks in a country come to an *agreement* to charge the *same high commissions* to all money transfers for their customers. Which *institution* may want to investigate such a policy? [4pts]
  - The Central Bank.
  - The Competition Authority.** *[Because this has to do with collusion in the market of banking and not with monetary regulations]*
  - The judicial system.
  - To government.
  - The Avengers.

5. Which of the following describes the channel through which shocks can be transmitted from the *money market* to the *market for output*? [4pts]
- Shocks *cannot* be transmitted from the one market to the other. [Wrong]
  - Change in output affects money demand. [From the commodity to the money market]
  - Change in the *interest rate* affects *government spending*. [Wrong]
  - Change in the *money supply* affects *money demand*. [Wrong]
  - Change in the interest rate affects investment.**
6. Which of the following describes the channel through which shocks can be transmitted from the *market for output* to the *money market*? [4pts]
- Shocks *cannot* be transmitted from the one market to the other. [Wrong]
  - Change in output affects money demand.**
  - Change in *consumption* affects the *money supply*. [Wrong]
  - Change in *consumption* affects *investment*. [Wrong]
  - Change in the *interest rate* affects *investment*. [From the money to the commodity market]
7. The Central Bank is going to *increase money supply* by 3%. Which of the following is accurate regarding *expected inflation* in this economy? [4pts]
- There will be more money in circulation, thus prices will increase, so inflation *should be expected*. [Only if growth is below 3%]
  - Inflation should be expected only if the growth rate of the economy is less than 3%.**
  - Inflation should be expected only if the economy is *not* in the *liquidity trap*. [An economy can be outside the liquidity trap and still not have inflation]
  - Inflation should be expected only if the economy has *high unemployment*. [An economy can have low inflation even when employment is high]
  - Inflation should be expected only if *prices are not controlled* by the government. [Non-sense]
8. In an economy there are 6 projects of \$100K each with *returns*: 6%, 5%, 5%, 4%, 3% and 1%. There are also 5 projects of 200K each with *returns*: 7%, 6%, 4%, 3% and 1%. Currently the total investment is \$1 million. What would be the *interest rate* if there is no shortage for investment funds in this economy? [4pts]
- 1.5%.
  - 2.5%.
  - 3.5%.**
  - 4.5%.
  - 5.5%.
- [There is 200K for the 7%; plus another 300K for the 6%; plus another 200K for the 5%; plus another 300K for the 4%, and all of those add to 1M. This means that even though there is no shortage of funds, no projects yielding below 4 percent are taken, thus the interest rate must be between 3 and 4%]
9. Which of the following cases is the best example of *frictional* unemployment? [4pts]
- An untrained individual who entered the labor force because he heard of *high efficiency wages* paid by some companies. [Not unemployed because is not qualified for an efficiency position]
  - An academic who will not find a job till the beginning of the next academic year.** [A case of unemployment that will be resolved with time]
  - A 55-year-old who is *continuously rejected* for several job openings because of his *age*. [A structural issue, the economy cannot absorb older people because of prejudice etc.]

- D. A manual worker for whom the *minimum wage* exceeds the value of his *potential production*. [A structural issue, the minimum wage]
- E. An electrical engineer who does not have time to *arrange interviews* because of his *temporary job*. [Not unemployed because has a job]
10. In which of the following markets *more output* will be sold under the same market demand? [4pts]
- A. A *monopoly* market.
- B. A *Cournot* duopoly.
- C. A Cournot duopoly with *collusion*.
- D. A Bertrand duopoly.** [ $p = MC$ , thus, in the end the *PC quantity* will be sold which is the *max*]
- E. A *Monopolistically Competitive* market.
11. Which of the following is *NOT true* for a natural monopoly? [4pts]
- A. If a natural monopoly is broken into several smaller firms, production will be *more costly*. [Pretty much the definition of a natural monopoly]
- B. If a natural monopoly is regulated to *price at MC*, it will produce the *perfectly competitive* quantity. [Anything forced to price at MC will emulate PC]
- C. If a natural monopoly is regulated to *price at AC*, it will not need to be *subsidized*. [Anything forced to price at AC will not have losses]
- D. If a natural monopoly produces quantity at  $MC = MR$ , it will not induce a DWL to the market.** [ $MC = MR$  is the monopolistic solution which comes with a DWL]
- E. If a natural monopoly *decreases price*, more *quantity* will be *demanded* by consumers. [Any seller should expect increase in sales if they decrease price]
12. Brenda used to be a math tutor earning 60 dollars an hour. Now, she makes and sells earrings. Each pair of earrings requires materials worth \$15 and it takes her 30 min to make. How much is her *economic profit per pair* if she sells each pair for \$45? [4pts]
- A. **Zero.**
- B. \$15.
- C. \$30.
- D. \$45.
- E. \$60.
- Each pair costs to Brenda \$15 for materials and \$30 for her time. Her total cost is \$45, equal to the price, so, her economic profit is zero.*
13. In which of the following ways will a decrease in the *taxation coefficient* affect the equilibrium output? [4pts]
- A. By increasing consumption.** [A decrease in the taxation coefficient will have a positive effect on  $C$ ; and thus, on  $Y$ ]
- B. By increasing taxation. [A decrease in the taxation coefficient will decrease taxation]
- C. By both of the above.
- D. By none of the above.

## PROBLEM A

[Scenario A] A market faces demand  $p = 10 - 2Q$ , while the marginal cost of production is  $MC = 2$ .

14. According to scenario A, if this market is populated by a large number of identical firms, what will be the price? [2pts]

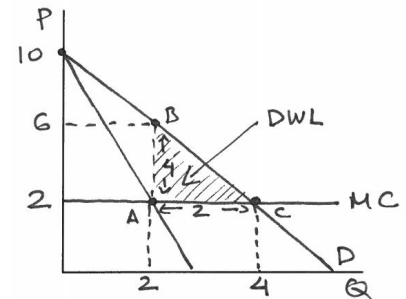
We can answer this by calculating the PC price.  $p = MC$  or  $p = 2$ .

15. According to scenario A, if the market is exploited by a single firm, at what price will this firm be selling? [2pts]

We can answer this by calculating the monopoly price.  $MR = 10 - 4Q$ . Then,  $MR = MC$  or  $10 - 4Q = 2$  or  $Q = 2$ .

16. According to scenario A, for the market above, draw an (approximate) figure showing the DWL under monopoly and calculate the DWL. [4pts]

The DWL is triangle ABC.  $DWL = \frac{1}{2} \cdot 4 \cdot 2 = 4$



## PROBLEM B

[Scenario B] A closed economy (where  $X = M$ ) has consumption function  $C = 200 + 0.5(Y - T)$ . Private investment is 90, government spends 70 and taxes are calculated as 20% of income.

17. Find the equilibrium output for the economy in scenario B. [3pts]

$Y = C + I + G$  or  $Y = 200 + 0.5(Y - T) + 90 + 70$  or  $Y = 360 + 0.5(Y - 0.2Y)$  or  $Y = 360 + 0.4Y$  or  $0.6Y = 360$  or  $Y = 600$ .

18. Find the equilibrium output for the economy in scenario B if the government spending increases to 100. [3pts]

$Y = C + I + G$  or  $Y = 200 + 0.5(Y - T) + 90 + 100$  or  $Y = 390 + 0.5(Y - 0.2Y)$  or  $Y = 390 + 0.4Y$  or  $0.6Y = 390$  or  $Y = 650$ .

## PROBLEM C

[Scenario C] A firm produces firfirikia. The price of one firfiriki is 10 dollars. The firm has 3 machines. The production function of the firm is  $Q = 2 \cdot K \cdot \sqrt{L}$  where  $K$  is the number of machines,  $L$  is the number of workers and  $Q$  is the quantity of firfirikia produced. The wage per worker is 20 dollars. All values are per hour.

19. How many workers will the firm in scenario C hire to maximize its profit? {Hint:  $\sqrt{1} = 1$ ;  $\sqrt{2} \approx 1.41$ ;  $\sqrt{3} \approx 1.73$ ;  $\sqrt{4} = 2$ ;  $\sqrt{5} \approx 2.24$ ;  $\sqrt{6} \approx 2.45$ } [7pts]

We know that the firm has 3 machines, thus the production function can be written as  $Q = 2 \cdot 3 \cdot \sqrt{L}$  or  $Q = 6\sqrt{L}$ .

- If it hires 1 worker,  $Q = 6\sqrt{1} = 6$ , revenue is  $10 \cdot 6 = 60$ ,  $MR = 60 - 0 = 60 > 20$ , the first worker will be hired.

- If it hires 2 workers,  $Q = 6\sqrt{2} = 8.49$ , revenue is  $10 \cdot 8.49 = 84.9$ ,  $MR = 84.9 - 60 = 24.9 > 20$ , the second worker will be hired.

- If it hires 3 workers,  $Q = 6\sqrt{3} = 10.39$ , revenue is  $10 \cdot 10.39 = 103.9$ ,  $MR = 103.9 - 84.9 = 19 < 20$ , the third worker will be hired.

Thus, the firm will only hire 2 workers.

## Short Answer Tasks

Answer the following questions in no more than 80 words.

20. Present and briefly explain one case where the economy exhibits inflation without increase in output. Name this particular kind of inflation and explain what exactly causes it. *[2 points penalty for exceeding 80 words]* [7pts]

*Stagflation occurs when prices increase while growth rates remain stagnant. It can be caused when structural reasons prevent the labor market from further increasing employment. Employers compete for existing employees by raising wages. Production costs increase raising prices of goods, while employment rate remains constant. (45 words)*

21. Define the following terms 'Fiat money' and 'Physical capital depreciation'. {Hint: only definition, no explanation, no examples} *[2 points penalty for exceeding 80 words]* [6pts]

*Fiat money: A medium of exchange that has no intrinsic value and is based on trust.*

*Physical capital depreciation: Loss of value for equipment due to physical wear and tear of obsolesce. [32 words]*

22. Briefly explain what economists mean when they say that 'collusion may not be a sustainable market outcome'. *[2 points penalty for exceeding 80 words]* [7pts]

*Collusion may not be a sustainable market outcome because it not the optimal response for any of the participants. This is because, once collusion is established all players have an incentive to deviate and cheat on the agreement, improving their own result and worsening the result of the rival. [49 words]*

23. Briefly explain how the Central Bank can set the interest rate. *[2 points penalty for exceeding 80 words]* [5pts]

*The CB estimates the money demand and then using open market operations sets the M1 money supply to the level that the intersection between the money demand and money supply will occur at the desirable interest rate. [37 words]*

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END OF EXAM

## Midterm Test

October 2019

### Multiple Choice Tasks

Select the answer that most closely answers the question.

- Which of the following will not affect the *demand for coffee*? [4pts]
  - A change in the price of coffee.
  - A change in the price of tea.
  - A change in the price of sugar.
  - A change in the price of milk.
  - All of the above will affect the demand for coffee.
- Magdalene divides a budget between *books* and *videogames*. In general, she likes both reading and gaming but she receives slightly more utility from the first hour of gaming than from the first hour of reading. Which of the following is correct for her preferred distribution of time between books and videogames? [4pts]
  - Inside* of the budget line towards the axis that counts hours of *gaming*.
  - Inside* of the budget line towards the axis that counts hours of *reading*.
  - On the budget line.
  - Outside* of the budget line towards the axis that counts hours of *gaming*.
  - Outside* of the budget line towards the axis that counts hours of *reading*.
- Which of the following is the basic reason why *firms* and *industries* are studied by a different branch of economics than the *macro economy*? [4pts]
  - The ceteris paribus concept.
  - The law of demand.
  - The post hoc propter ergo hoc fallacy.
  - The fallacy of composition.
  - The opportunity cost.
- Which of the following is correct about the long-run AC? [4pts]
  - Its shape is a result of diminishing returns.
  - It intersects with AVC at its minimum point.
  - Every single one of its points is the minimum of some short-run AC curve.
  - All of the above are correct.
  - None of the above is correct.
- Which of the following costs *should be considered* in a rational economic decision? [4pts]
  - The opportunity cost but NOT the sunk cost.
  - The sunk cost but NOT the opportunity cost.
  - Both the sunk cost and the opportunity cost.
  - Neither the sunk cost nor the opportunity cost.
  - Either the opportunity cost or the sunk cost but NOT both.

6. Candice divides a budget of \$80 between food and entertainment. Utility from consumption is shown below.

Units	1	2	3	4	5	6
Utility from food	65	105	125	130	134	136
Utility from entertainment	40	80	110	130	140	145

The price of one unit of *entertainment* is \$10 and the price of one unit of *food* is also \$10. Currently, Candice consumes 4 units of *food* and 4 units of *entertainment*. Which of the following is both *feasible* and *true*? [4pts]

- A. Candice should NOT change the distribution of her budget.
  - B. Candice would be better off if she consumed more *food* and less *entertainment*.
  - C. Candice would be better off if she consumed more entertainment and less food.
  - D. Candice would be better off if she consumed less of both.
  - E. Candice would be better off if she consumed more of both.
7. A PC firm with a U-shaped AC curve supplies quantity within the range of *diminishing returns* and sells it at a price equal to MC. What can you tell for this firm? [4pts]
- A. It can increase profit by *decreasing* production.
  - B. It can increase profit by *increasing* production.
  - C. It makes the minimum possible *loss* given the market conditions.
  - D. It makes the maximum possible profit given the market conditions.
  - E. It makes *zero profit*.
8. Which of the following is accurate? [4pts]
- A. The *supply curve* for a monopoly is always less elastic than the supply curve of a PC firm.
  - B. The *supply curve* for a monopoly is always more elastic than the supply curve of a PC firm.
  - C. The *supply curve* for a monopoly is always equally elastic to the supply curve of a PC firm.
  - D. The *supply curve* for a monopoly may be more or less elastic than the supply curve of a PC firm.
  - E. None of the above is accurate.
9. In many cities around the world the number of taxi cabs is controlled by the local regulators by assigning a fixed number of taxi *permits*. In those cities, the large number of cabs does not allow for meaningful interaction, and thus, taxis are *price taking* firms. Additionally, the taxi services are considered completely homogeneous. Which of the following is true if the number of total permits is *held constant* every year? [4pts]
- A. The taxi industry can maintain S-R profits in the L-R.
  - B. S-R profit will be eliminated in the L-R.
  - C. Taxi owners have market power.
  - D. The taxi industry is a natural monopoly.
  - E. All of the above are true.
10. Which of the following is true about a binding *price ceiling* imposed by a regulator? [4pts]
- A. It may help decrease the DWL in both a *monopoly* and a *PC market*.
  - B. It may help decrease the DWL in a *PC market* but it will increase it in a *monopoly*.
  - C. It may help decrease the DWL in a monopoly but it will increase it in a PC market.
  - D. It will make the DWL worse in both a *monopoly* and a *PC market*.
  - E. It will not affect the DWL neither in a *monopoly*, nor in a *PC market*.



11. Firm 1 and firm 2 are the *only* two competitors in a market of a *homogeneous good* with *barriers of entry*. Both firms have zero *MC*, face a *linear market demand* and compete with *quantities* for one *single time*. Which of the following is the worst scenario in terms of profit for firm 1? [4pts]
- It colludes with firm 2.
  - It colludes with firm 2 and firm 1 (only) cheats.
  - It colludes with firm 2 and firm 2 (only) cheats.
  - It competes with firm 2 without colluding.
12. Which of the following is always true in a market where firms have *market power*? [4pts]
- Demand curves for the firms' products are negatively sloped.
  - Price *exceeds* the AC.
  - The firms have *positive S-R profits*.
  - Barriers of entry guarantee *profits in the L-R period*.
  - All of the above are *always true*.

## PROBLEM A

[Scenario A] Firm 1 and firm 2 compete by setting quantities. Market demand is  $p = 14 - 2Q$ . Each firm has zero fixed costs and constant  $MC = 2$ .

- Find the profit maximizing *quantities* of the two firms in scenario A. [4pts]
- Find the *profits* for the two firms in scenario A. [3pts]
- Find the *total quantity* the two firms in scenario A will produce if they collude. [2pts]
- Find the *profits* for each firm in scenario A from collusion. [2pts]
- Find the *quantities* the two firms in scenario A will produce if they compete with respect to price instead of quantity. [4pts]

## PROBLEM B

[Scenario B] 1. Pierre used to be a tutor of French and he was charging \$60 per hour. Recently he became a tattoo artist. The market of tattoos is perfectly competitive and the price for a tattoo is \$25. The cost of materials is \$5 per tattoo. Every working day, it takes Pierre 10 minutes to complete the first tattoo, 11 minutes for the second, 12 minutes for the third and the time keeps increasing by 1 minute per tattoo.

- How many tattoos should Pierre from scenario B do in order to maximize his daily economic profit? [5pts]
- Calculate Pierre's maximum daily *economic profit* in scenario B. [5pts]
- Calculate Pierre's maximum daily *accounting profit* in scenario B. [5pts]

## Short Answer Tasks

Answer the following questions in no more than 80 words.

- Define the terms 'Market failure', 'Inferior good', 'Predatory pricing'. {Hint: only one sentence each for definition, no explanations, no examples}. **[2 points penalty for exceeding 80 words]** [8pts]
- Briefly explain how a *meeting competition clause* can facilitate collusion. **[2 points penalty for exceeding 80 words]** [7pts]

23. Briefly explain how *building excess capacity* can help in rent seeking. *[2 points penalty for exceeding 80 words]* [7pts]

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END OF TEST

## Midterm Test – KEY

October 2019

### Multiple Choice Tasks

Select the answer that most closely answers the question.

- Which of the following will not affect the *demand for coffee*? [4pts]
  - A change in the price of coffee.** [Own price does not affect demand]
  - A change in the price of tea.
  - A change in the price of sugar.
  - A change in the price of milk.
  - All of the above will affect the demand for coffee.
- Magdalene divides a budget between *books* and *videogames*. In general, she likes both reading and gaming but she receives slightly more utility from the first hour of gaming than from the first hour of reading. Which of the following is correct for her preferred distribution of time between books and videogames? [4pts]
  - Inside of the budget line towards the axis that counts hours of *gaming*. [Not maximizing utility]
  - Inside of the budget line towards the axis that counts hours of *reading*. [Not maximizing utility]
  - On the budget line.**
  - Outside of the budget line towards the axis that counts hours of *gaming*. [Unattainable]
  - Outside of the budget line towards the axis that counts hours of *reading*. [Unattainable]
- Which of the following is the basic reason why *firms* and *industries* are studied by a different branch of economics than the *macro economy*? [4pts]
  - The ceteris paribus concept.
  - The law of demand.
  - The post hoc propter ergo hoc fallacy.
  - The fallacy of composition.** [Units may behave different than aggregates]
  - The opportunity cost.
- Which of the following is correct about the long-run AC? [4pts]
  - Its shape is a result of diminishing returns. [True for the S-R]
  - It intersects with AVC at its minimum point. [True for the S-R]
  - Every single one of its points is the minimum of some short-run AC curve.** [True]
  - All of the above are correct.
  - None of the above is correct.
- Which of the following costs *should be considered* in a rational economic decision? [4pts]
  - The opportunity cost but NOT the sunk cost.**
  - The sunk cost but NOT the opportunity cost.
  - Both the sunk cost and the opportunity cost.
  - Neither the sunk cost nor the opportunity cost.
  - Either the opportunity cost or the sunk cost but NOT both.

[The opportunity cost is incurred so it should be considered. Once a cost is sunk it does not affect decisions, thus it should not be considered]

6. Candice divides a budget of \$80 between food and entertainment. Utility from consumption is shown below.

Units	1	2	3	4	5	6
Utility from food	65	105	125	130	134	136
Utility from entertainment	40	80	110	130	140	145

The price of one unit of *entertainment* is \$10 and the price of one unit of *food* is also \$10. Currently, Candice consumes 4 units of *food* and 4 units of *entertainment*. Which of the following is both *feasible* and *true*? [4pts]

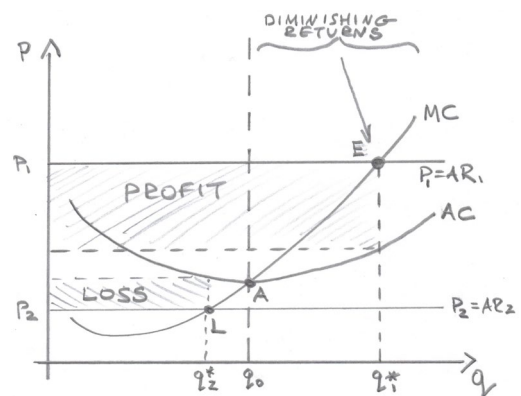
- Candice should NOT change the distribution of her budget.
- Candice would be better off if she consumed more *food* and less *entertainment*.
- Candice would be better off if she consumed more entertainment and less food.**
- Candice would be better off if she consumed less of both.
- Candice would be better off if she consumed more of both. [Unattainable]

[The easiest way to solve this is to consider that when she consumes 4 of both, her total utility is  $130 + 130 = 260$ . If she sacrifices 1 unit of entertainment for 1 unit of food, her total utility will become  $134 + 110 = 244$ ; so she does not want to go that direction. If, instead, she sacrifices 1 unit of food for 1 unit of entertainment, her utility will become  $125 + 140 = 265$  which is preferable]

7. A PC firm with a U-shaped AC curve supplies quantity within the range of *diminishing returns* and sells it at a price equal to MC. What can you tell for this firm? [4pts]

- It can increase profit by *decreasing* production.
- It can increase profit by *increasing* production.
- It makes the minimum possible *loss* given the market conditions.
- It makes the maximum possible profit given the market conditions.**
- It makes *zero profit*.

*Diminishing returns start at quantity  $q_0$  (because the AC is minimum there). If the firm produces a quantity  $q_1^*$  above  $q_0$ , its AC will be below its MC. Since the PC firm prices on the MC (point E), its price will also be above its AC. Thus, the firm will always have profit when its optimum quantity is within the range of diminishing returns because there  $p = MC$  always happens above AC. Conversely, if the firm sold quantity  $q_2^* < q_0$ , the equality  $p = MC$  would occur below the AC (point L) yielding losses.*



8. Which of the following is accurate? [4pts]

- The *supply curve* for a monopoly is always less elastic than the supply curve of a PC firm.
- The *supply curve* for a monopoly is always more elastic than the supply curve of a PC firm.
- The *supply curve* for a monopoly is always equally elastic to the supply curve of a PC firm.
- The *supply curve* for a monopoly may be more or less elastic than the supply curve of a PC firm.
- None of the above is accurate. [Unicorn!]**

9. In many cities around the world the number of taxi cabs is controlled by the local regulators by assigning a fixed number of taxi *permits*. In those cities, the large number of cabs does not allow for meaningful interaction, and thus, taxis are *price taking* firms. Additionally, the taxi services are considered completely homogeneous. Which of the following is true if the number of total permits is *held constant* every year? [4pts]
- A. **The taxi industry can maintain S-R profits in the L-R.** *[Yes, because entry is not free. If there are S-R profits, those will be maintained in the L-R]*
  - B. S-R profit will be eliminated in the L-R. *[No because entry is not allowed]*
  - C. Taxi owners have market power. *[No, they are price takers]*
  - D. The taxi industry is a natural monopoly. *[There are more than 1 firms]*
  - E. All of the above are true.
10. Which of the following is true about a binding *price ceiling* imposed by a regulator? [4pts]
- A. It may help decrease the DWL in both a *monopoly* and a *PC market*.
  - B. It may help decrease the DWL in a *PC market* but it will increase it in a *monopoly*.
  - C. **It may help decrease the DWL in a monopoly but it will increase it in a PC market.**
  - D. It will make the DWL worse in both a *monopoly* and a *PC market*.
  - E. It will not affect the DWL neither in a *monopoly*, nor in a *PC market*.  
*[A price ceiling in Monopoly, may reduce the DWL. In PC it will induce a DWL]*
11. Firm 1 and firm 2 are the *only* two competitors in a market of a *homogeneous good* with *barriers of entry*. Both firms have zero *MC*, face a *linear market demand* and compete with *quantities* for one *single time*. Which of the following is the worst scenario in terms of profit for firm 1? [4pts]
- A. It colludes with firm 2.
  - B. It colludes with firm 2 and firm 1 (only) cheats.
  - C. **It colludes with firm 2 and firm 2 (only) cheats.**
  - D. It competes with firm 2 without colluding.  
*[As we saw in the lecture, when a firm cheats, it causes damage to the other firm that brings the profit of the latter below the Cournot competition profit]*
12. Which of the following is always true in a market where firms have *market power*? [4pts]
- A. **Demand curves for the firms' products are negatively sloped.** *[You cannot have market power with a horizontal demand for the firm]*
  - B. Price exceeds the AC. *[Not necessarily]*
  - C. The firms have *positive S-R profits*. *[Not necessarily]*
  - D. Barriers of entry guarantee *profits in the L-R period*. *[Barriers of entry allow for S-R results to be maintained in the L-R. If the industry has losses, barriers of entry will not magically turn those to profits]*
  - E. All of the above are *always true*.

## PROBLEM A

[Scenario A] Firm 1 and firm 2 compete by setting quantities. Market demand is  $p = 14 - 2Q$ . Each firm has zero fixed costs and constant  $MC = 2$ .

13. Find the profit maximizing quantities of the two firms in scenario A. [4pts]

Demand will be  $p = 14 - 2q_1 - 2q_2$ . Marginal revenue for firm 1 will be  $MR_1 = 14 - 2q_2 - 4q_1$ .  $MR_1 = MC$  yields  $14 - 2q_2 - 4q_1 = 2$  or because firms are symmetric and identical  $q_1 = q_2$ ,  $14 - 6q_1 = 2$  or  $6q_1 = 12$  or  $q_1 = q_2 = 2$ .

14. Find the profits for the two firms in scenario A. [3pts]

The price in the market will be  $p = 14 - 2(q_1 + q_2) = 14 - 2(4) = 6$ . Also because  $FC = 0$ ,  $AC = MC = 2$ . Thus, profit for firm 1 is  $(p - AC)q_1 = (6 - 2)2 = 8$  and the same is true for firm 2.

15. Find the total quantity the two firms in scenario A will produce if they collude. [2pts]

The marginal revenue for the market is  $MR = 14 - 4Q$ . Setting  $MR = MC$  or  $14 - 4Q = 2$  or  $Q = 3$ .

16. Find the profits for each firm in scenario A from collusion. [2pts]

If firms collude, price will be  $p = 14 - 2(3) = 8$ . Then, total profit will be  $(p - AC)Q = (8 - 2)3 = 18$  or profit per firm will be 9 units.

17. Find the quantities the two firms in scenario A will produce if they compete with respect to price instead of quantity. [4pts]

If they compete with respect to price,  $p = MC$  or  $p = 2$ . From the demand  $p = 14 - 2Q$  or  $2 = 14 - 2Q$  or  $2Q = 12$  or  $Q = 6$  or  $q_1 = q_2 = 3$ .

## PROBLEM B

[Scenario B] 1. Pierre used to be a tutor of French and he was charging \$60 per hour. Recently he became a tattoo artist. The market of tattoos is perfectly competitive and the price for a tattoo is \$25. The cost of materials is \$5 per tattoo. Every working day, it takes Pierre 10 minutes to complete the first tattoo, 11 minutes for the second, 12 minutes for the third and the time keeps increasing by 1 minute per tattoo.

18. How many tattoos should Pierre from scenario B do in order to maximize his daily economic profit? [5pts]

Pierre's Marginal Revenue is \$25. Each tattoo costs him \$5 in terms of materials and  $(9 + q)$  dollars on terms of time, where  $i$  is the order of the tattoo ( $i = 1$  for the first,  $i = 2$  for the second etc.).  $MR = MC$  yields  $25 = 5 + 9 + i$ , or  $i = 11$ . This means that  $MR = MC$  at the 11th tattoo.

19. Calculate Pierre's maximum daily economic profit in scenario B. [5pts]

Pierre's revenue is  $25 \cdot 11 = 275$  dollars. Pierre's cost is  $15 + 16 + \dots + 25 = 220$ . His daily profit is  $275 - 220 = 55$  dollars.

\* if you want to calculate the sum  $15 + 16 + \dots + 25$  quickly, you can notice that it has 11 terms and its average term is the middle one (20), thus it is equal to  $20 \cdot 11$ . Otherwise, you can spend 60 seconds more and add all 11 terms.

20. Calculate Pierre's maximum daily *accounting profit in scenario B*. [5pts]

*For the accounting profit we must not use the cost of time. Thus, Pierre's revenue is still  $25 \cdot 11 = 275$  dollars. Pierre's cost is  $5 \cdot 11 = 55$ . His daily accounting profit is  $275 - 55 = 220$  dollars.*

## Short Answer Tasks

Answer the following questions in no more than 80 words.

21. Define the terms 'Market failure', 'Inferior good', 'Predatory pricing'. {Hint: only one sentence each for definition, no explanations, no examples}. **[2 points penalty for exceeding 80 words]** [8pts]

*'Market failure': A situation where the market outcome is socially undesirable.*

*'Inferior good': A good for which consumers buy more when their income decreases.*

*'Predatory pricing': When a seller sets price below the rival's AC but also below its OWN AC. [41 words]*

22. Briefly explain how a *meeting competition clause* can facilitate collusion. **[2 points penalty for exceeding 80 words]** [7pts]

*Meeting competition clause is when a seller announces publicly that will meet all discounts by competition. By doing this, the seller commits to rivals that a price war will start if they undercut. This is a credible commitment because once the announcement is public, customers will demand the seller to honor the clause and he will not be able to renege. This shows to competitors that the seller will take undercutting seriously. [72 words]*

23. Briefly explain how *building excess capacity* can help in rent seeking. **[2 points penalty for exceeding 80 words]** [7pts]

*Building excess capacity is a threat to potential entrants that if they enter, the seller has the necessary EoS to drop the price below the entrant's AC, so that the incumbent may still have (a small) profit but the entrants will incur losses. This prevents entry, assuring a monopoly position for the incumbent. (53 words)*

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END OF TEST