

Midterm Test – Key

AY 2026-27 t1 - Oct. 3, 2026

Multiple Choice Tasks

Select the answer that most closely answers the question.

1. A freelance graphic designer earns \$50 per hour designing logos and has plenty of clients. Last week, she spent 4 hours redesigning the layout of her business website. She then paid a developer \$70 to fix the backend code so the new layout would work properly. What was the designer's total opportunity cost of redesigning her website?

A. Around \$70.
B. ***Around \$200.**
C. Around \$230.
D. Around \$270.

[The designer gave up 4 hours of design work at \$50 per hour, for an opportunity cost of \$200. The \$70 paid to the developer is an explicit accounting cost, not an opportunity cost, since it is an out of pocket payment rather than a forgone alternative. A common mistake is to add this \$70 to the opportunity cost, giving \$270]

2. A city planner has surveyed all residents about their preferences regarding the construction of a park. Which of the following best illustrates the representative agent assumption in how she uses this data?

A. She builds a detailed model that tracks the preferences of every individual resident separately.
[Models every individual separately, the opposite of the representative agent]
B. She divides residents into groups by age, income, and lifestyle, and designs the park to satisfy each group.
[Uses multiple representative groups, which is closer to a heterogeneous agent approach]
C. ***She calculates the average preferences across all residents and designs the park as if every resident shares those average preferences.** *[The representative agent simplifies the analysis by treating the population as identical copies of one average individual]*
D. She focuses on the preferences of the majority and ignores the minority whose preferences differ significantly.
[Ignores a subset rather than representing the whole population through an average]

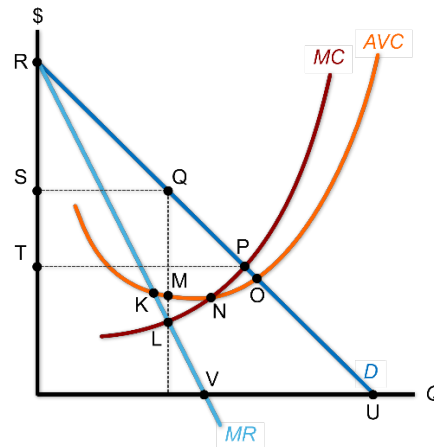
3. Which of the following goods is likely to have the most inelastic demand?

A. Marijuana. *[Marijuana is one of the least addictive drugs and has many relatively close substitutes]*
B. ***Petrol.** *[Petrol has very few short-run substitutes for most drivers, making demand highly inelastic]*
C. Pepsi-Cola. *[Pepsi-Cola has many close substitutes such as Coca-Cola and other soft drinks, making demand elastic]*
D. Cereal bars. *[Cereal bars have many substitutes among snack and breakfast products, making demand elastic]*

4. Which of the following does NOT cause the demand curve for cinema tickets to shift to the right, assuming cinema is a normal good?
- A. ***A fall in the price of cinema tickets.** *[A price change causes a movement along the demand curve, not a shift. This is the distinction between quantity demanded and demand]*
 - B. A rise in average household income. *[Higher income increases demand for normal goods, shifting the curve right]*
 - C. A rise in the price of streaming services, a substitute for cinema. *[More expensive streaming makes cinema relatively cheaper, increasing demand and shifting the curve right]*
 - D. A fall in the price of popcorn, a complement to cinema. *[Cheaper popcorn increases demand for cinema visits, shifting the curve right]*
5. A bakery can produce 2,000 loaves of bread per day in four different ways: (i) using 8 bakers and 5 ovens; (ii) using 6 bakers and 7 ovens; (iii) using 4 bakers and 6 ovens; (iv) using 3 bakers and 9 ovens. Which of the following statements is correct?
- A. Combination (i) is less efficient than (ii). *[We cannot tell — (ii) uses fewer bakers but more ovens than (i)]*
 - B. ***Combination (ii) is less efficient than (iii).** *[Combination (iii) uses both fewer bakers and fewer ovens than (ii) to produce the same output, so (ii) is dominated]*
 - C. Combination (iii) is less efficient than (iv). *[We cannot tell — (iv) uses fewer bakers but more ovens than (iii)]*
 - D. None of the above.
6. Suppose there are 120 identical, perfectly competitive fish farms. Each farm sells 1,000 kg of fish per year at a market price of \$30 per kg, and has variable costs of \$22,000. Each farm also pays an annual lease of \$12,000 to the state for the right to operate. All leases expire at the end of the year. How many farms will there be next year?
- A. None.
 - B. More than 120.
 - C. ***Fewer than 120.**
 - D. There is insufficient information to determine the answer.
- [Each farm earns revenue of $1,000 \times \$30 = \$30,000$ against total cost of \$34,000 (\$22,000 + \$12,000) — a loss of \$4,000. Since losses are unsustainable, some farms will not renew their lease. As farms exit, market supply decreases and price rises until the remaining farms break even. The number of farms after one year will therefore be below 120 but not zero]*
7. A factory hires more workers to run an extra shift and finds that each additional worker adds less output than the previous one. Which of the following correctly identifies the concept at work?
- A. Economies of scale.
 - B. Diseconomies of scale.
 - C. Increasing returns.
 - D. ***Diminishing returns.**

[Workers are being added to a fixed production facility. When a variable input is added to a fixed input and each additional unit contributes less to output than the previous one, this is the Law of Diminishing Returns. Economies and diseconomies of scale are long-run concepts involving proportional changes in all inputs, not the addition of one variable input to a fixed one]

8. A monopolist sells the quantity at which marginal revenue equals marginal cost. Which of the following would increase the monopolist's profit?
- A. To increase the price by \$1. *[At the profit-maximizing quantity, any deviation from $MR = MC$ reduces profit. Raising the price reduces quantity sold and moves the firm away from its optimum]*
 - B. To sell one additional unit. *[Beyond the profit-maximizing quantity, MC exceeds MR . Selling one more unit adds more to cost than to revenue, reducing profit]*
 - C. ***To lower the marginal cost.** *[A lower MC shifts the cost curve down, creating a new $MR = MC$ intersection at a higher quantity and lower cost per unit, increasing profit]*
 - D. All of the above.
9. Which of the following represents consumer surplus in this monopoly?



- A. ***QSR.** *[Consumer surplus is the area above the monopoly price S and below the demand curve. This is the triangle bounded by R, S, and Q]*
 - B. PTR. *[This would be the consumer surplus if the market was perfectly competitive]*
 - C. QMO. *[This area is nothing in particular – DWL is QMP]*
 - D. SQTP. *[It is the difference in consumer surplus between B and A]*
10. Which of the following is NOT true for both oligopoly and monopolistic competition?
- A. Oligopoly assumes interaction between firms while monopolistic competition does not. *[True. Oligopolists are interdependent and must anticipate rivals' reactions. Monopolistically competitive firms act independently due to the large number of competitors]*
 - B. ***Neither oligopoly nor monopolistic competition can exist without product differentiation.** *[False. Monopolistic competition requires product differentiation by definition, but oligopoly can involve homogeneous products such as steel or crude oil]*
 - C. Oligopoly usually has fewer firms than monopolistic competition. *[True. Oligopoly involves a small number of large firms, while monopolistic competition involves many firms]*
 - D. Both oligopoly and monopolistic competition exhibit deadweight loss. *[True. Both market structures produce below the socially optimal quantity, generating deadweight loss]*

11. Oil companies extracting Brent crude must decide how many wells to drill and how much to pump years before their output reaches the market. Once a well is operational, its output capacity is largely fixed by the geological and engineering constraints of the reservoir. Which of the following models best describes competition among Brent crude extractors?
- A. The perfectly competitive model, because there is a large number of Brent crude extractors and no barriers to entry. *[Oil extraction has very high barriers to entry due to capital requirements, technology, licenses, and geological access. The industry is dominated by a small number of large firms]*
 - B. The monopolistic competition model, because different companies extract Brent crude of different quality. *[All Brent crude meets the same standardized specification. A barrel from one producer is identical to a barrel from another, making product differentiation impossible]*
 - C. ***The Cournot model, because companies decide their quantity first, and then the price is determined by the total quantity that reaches the market.** *[Firms must decide and commit to quantities in advance. Price is determined later by the demand]*
 - D. The Bertrand model, because quantity is fixed and companies compete on price. *[Bertrand competition requires firms to compete on price with quantity adjusting freely to meet demand]*
12. Which of the following would most likely increase producer surplus in a perfectly competitive market?
- A. Impose a price ceiling below the equilibrium price. *[It will lower the price received by sellers, reducing the gap between price and their minimum acceptable price. Producer surplus falls]*
 - B. ***Impose a price floor above the equilibrium price.** *[It will raise the price received by sellers, increasing the gap between price and their minimum acceptable price. Producer surplus rises]*
 - C. Impose a per unit tax on the good. *[It will reduce the quantity sold and lower the price received net of tax. Producer surplus falls]*
 - D. Impose a per unit tax on producers. *[Same effect as C]*
13. A natural monopoly is currently producing at the profit-maximizing quantity. A regulator imposes a price ceiling at $P = AC$. Which of the following best describes the outcome?
- A. The firm will produce the socially optimal quantity. *[The socially optimal quantity requires $P = MC$]*
 - B. The firm will make losses. *[At $P = AC$, total revenue exactly covers total cost. The firm breaks even]*
 - C. ***The firm can remain viable without a subsidy.** *[At $P = AC$, the firm breaks even]*
 - D. All of the above.

Problem A

[Scenario A] The market for artisanal coffee in a small city is initially served by a single firm, Roast & Co. The market demand is $p = 260 - 2Q$. Roast & Co. has $MC = 20 + 2q$ and $AC = 20 + q$, where q is its individual output.

14. According to scenario A, how much profit does Roast & Co. earn as the sole supplier in the market?

- A. Around \$2,700.
- B. Around \$3,500.
- C. Around \$4,200.
- D. *Around \$4,800.**
- E. Around \$6,000.

[MR = MC: $260 - 4q = 20 + 2q \rightarrow q = 40$, $p = \$180$. AC at $q = 40$: $AC = \$60$.

Profit = $(180 - 60) \times 40 = \$4,800$]

15. Attracted by Roast & Co.'s profits in scenario A, a second firm, Brew Bros., enters the market with identical costs and the two firms compete on quantity. How much profit will each firm earn?

- A. Around \$1,600.
- B. Around \$2,000.
- C. *Around \$2,700.**
- D. Around \$3,500.
- E. Around \$4,800.

[Best response: $260 - 4q - 2q_j = 20 + 2q \rightarrow 240 = 8q \rightarrow q = 30$, $Q = 60$, $p = \$140$. AC at $q = 30$: $AC = \$50$. Profit per firm = $(140 - 50) \times 30 = \$2,700$]

16. In scenario A, word spreads and many more identical firms enter the market, making it perfectly competitive. The market price settles at \$100. How much profit will each firm earn?

- A. Around \$800.
- B. Around \$1,200.
- C. *Around \$1,600.**
- D. Around \$2,700.
- E. Around \$4,800.

[Each firm produces where $P = MC$: $100 = 20 + 2q$, so $q = 40$. AC at $q = 40$: $AC = 20 + 40 = \$60$.

Profit per firm = $(100 - 60) \times 40 = \$1,600$]

Problem B

[Scenario B] DropBeat, a music production studio, operates on the ground floor of a mixed-use building. The bass from its subwoofers does not exceed noise regulations but disturbs SleepWell, a sleep therapy clinic on the floor above, causing clients to abandon sessions and leave negative reviews. SleepWell's owner has estimated that the noise has decreased the clinic's profits from \$190,000 to \$110,000. DropBeat could install professional acoustic panels to eliminate the noise entirely.

17. According to scenario B, if the acoustic panels cost \$50,000 per year, which of the following payments from SleepWell to DropBeat would make both parties willing to reach a deal to install the panels?

- A. \$45,000.
- B. \$70,000.**
- C. \$90,000.
- D. None of the above.

[The harm to SleepWell is $\$190,000 - \$110,000 = \$80,000$ per year. The panels cost \$50,000, so DropBeat would not accept less than \$50,000. SleepWell would not pay more than \$80,000, since that is the full extent of the harm it suffers. B is in that range]

18. According to scenario B, above which annual cost of the acoustic panels will the externality most likely persist?

- A. Above \$50,000.
- B. Above \$60,000.
- C. Above \$70,000.
- D. *Above \$80,000.**

[The harm to SleepWell is \$80,000 per year. If the panels cost more than \$80,000, SleepWell would never pay enough to cover DropBeat's cost of installing them, since doing so would cost more than the harm itself. No mutually beneficial deal exists above this threshold, and the externality persists]

Short Answer Tasks

Answer the following questions in no more than 80 words.

19. Provide an example of a market that fails by not being able to reach an equilibrium. [7p] *[Limit 80 words]*
The labor market is a typical example where workers and job openings often fail to match efficiently, allowing a shortage of workers in some sectors and a surplus of workers in others to be observed simultaneously. [32 words]
20. Explain how can you regulate a non-natural monopoly to produce the quantity at which $P=AC$. [7p] *[Limit 80 words]*
You cannot force a non-natural monopoly to produce at $P = AC$. Since its AC curve is U-shaped, there exists a smaller quantity where AC is lower than the ceiling price, allowing the monopolist to earn positive profit there instead of the zero profit it would earn at $P = AC$. [51 words]
21. Explain which characteristic of an oligopolistic market would make you use the kinked demand model. [7p] *[Limit 80 words]*
I would use the kinked demand model if rivals responded asymmetrically to price changes: they match price cuts but ignore price increases. The model is appropriate when prices appear rigid despite shifts in costs or demand. [36 words]
22. Explain what is rent-seeking and how it differs from profit maximization. [7p] *[Limit 80 words]*
Rent-seeking is the use of resources to capture existing economic value without creating new value, typically through lobbying for monopoly privileges or favorable regulation. Unlike profit maximization, which involves producing and selling goods or services, rent-seeking wastes real resources on redistribution rather than production, yielding no net gain for society. [50 words]

END OF TASKS