# Homework 5 – KEY

Average: 78.39 + 0pts GI bonus

Due on 13/2/2024, by 23:00

This assignment is optional but STRONGLY RECOMMENDED. If you do not submit the answers till the deadline, the score of your final exam will substitute for the score for this assignment. Submit only the correct letter for each task on eLearn under 'Quizzes' within 'COR2100-Economics and Society G7-8-9-10'. Note that the actual text of questions and answers is not supposed to appear on the eLearn quiz. You have unlimited attempts. The system is programmed to credit your last attempt. Be informed that if you submit an attempt and afterwards you re-open the quiz, you must submit your answers AGAIN. Otherwise, the system will grade the unfinished attempt with 0 (because it is the last one) and there is NOTHING I can do to fix this after the fact. Late homework or homework submitted outside eLearn cannot be accepted as this would violate SMU official policy for fairness and transparency in grading. This assignment is protected by Grade Insurance™: If the assignment's average turns out to be below 75, an equal amount of bonus points will be given to every work, for the average to become 75. Direct any homework questions to your TA.

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**Scenario 5.1**: Firm 1 and firm 2 share a market with demand $p = 1,400 - 10Q$, where $Q$ denotes the total quantity sold in the market. Each firm's cost is $FC = \$1,000$ and $MC = 200$.

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1. According to scenario 5.1, if the two firms acted as PC competitors, what quantity would each sell?
    - A. Around 20 units.
    - B. Around 30 units.
    - C. Around 40 units.
    - D. Around 50 units.
    - 97% **E. Around 60 units.**
    - F. Around 70 units.

    *[They will set $p = MC$ or $1,400 - 10Q = 200$ or $10Q = 1,200$ or $Q = 120$. Thus, each firm will sell 60 units]*

2. According to scenario 5.1, if the two firms act as PC competitors, what will the price be?
    - A. Around $100.
    - 97% **B. Around $200.**
    - C. Around $300.
    - D. Around $400.
    - E. Around $500.
    - F. Around $600.

    *[Price will be equal to the MC. Thus, $p = \$200$]*

3. According to scenario 5.1, if the two firms acted as PC competitors, what would the profit for each firm be?
    - 64% **A. Around -$1,000.**
    - B. Around -$500.
    - 34% C. Zero.
    - D. Around $500.
    - E. Around $1,000.
    - F. We need more information to answer.

    *[Since MC is constant, every next unit costs the same and therefore AVC should be also constant and equal to the MC. Thus, the profit could be calculated as $(p - AVC) \cdot q - FC = (200 - 200) \cdot 60 - 1,000 = -\$1,000$]*

4.✓ According to scenario 5.1, if the two firms competed in quantities and you know that at equilibrium they would produce equal quantities, how much would each firm produce?

    A. Around 20 units.

    B. Around 30 units.

*84%*C. **Around 40 units.**

    D. Around 50 units.

    E. Around 60 units.

    F. Around 70 units.

*[We can solve this for the first firm as: $MR_1 = MC$ or $1,400 - 10q_2 - 20q_1 = 200$ or $20q_1 = 1,200 - 10q_2$ or $q_1 = 60 - 0.5q_2$, which is the optimal reaction function for firm 1. Since we know that at equilibrium $q_1 = q_2$, we can write $q_1 = 60 - 0.5q_1$ or $q_1 = 40$, which implies that $q_2 = 40$, as well]*

5.✓ According to scenario 5.1, if the two firms compete in quantities, what will the price be?

    A. Around $100.

    B. Around $200.

    C. Around $300.

    D. Around $400.

    E. Around $500.

*84%*F. **Around $600.**

*[Price will again be given by the demand curve: $p = 1,400 - 10 \cdot (40 + 40) = \$600$]*

6.✓ According to scenario 5.1, if the two firms compete in quantities, what will the profit for each firm be?

    A. Around $9,000.

    B. Around $11,000.

    C. Around $13,000.

*82%*D. **Around $15,000.**

    E. Around $17,000.

    F. Around $19,000.

*[The profit can be calculated as $(p - AVC) \cdot q - FC = (600 - 200) \cdot 40 - 1,000 = \$15,000$]*

7.✓ According to scenario 5.1, if the two firms colluded, how much would each firm produce?

    A. Around 20 units.

*90%*B. **Around 30 units.**

    C. Around 40 units.

    D. Around 50 units.

    E. Around 60 units.

    F. Around 70 units.

*[The $MR = 1,400 - 20Q$, must be equal to the MC. That is, $1,400 - 20Q = 200$ or $Q = 60$ and each firm produces 30 units]*

8.✓ According to scenario 5.1, if the two firms colluded, what would the price be?

    A. Around $200.

    B. Around $400.

    C. Around $600.

*92%*D. **Around $800.**

    E. Around $1,000.

    F. Around $1,200.

*[Price will be calculated by the demand curve. $p = 1,400 - 10 \cdot 60$ or $p = \$800$]*

9. According to scenario 5.1, if the two firms colluded, what would profit be for each firm?

    A. Around $9,000.
    B. Around $11,000.
    C. Around $13,000.
    D. Around $15,000.
  85% E. **Around $17,000.**
    F. Around $19,000.

    *[The profit can be calculated as $(p - AVC) \cdot q - FC = (800 - 200) \cdot 30 - 1,000 = \$17,000]$*

10. According to scenario 5.1, the two firms collude but firm 1 alone decides to 'cheat', while it believes that firm 2 will not cheat. How much will firm 1 produce?

    A. Around 15 units.
    B. Around 25 units.
    C. Around 35 units.
  80% D. **Around 45 units.**
  10% E. Around 55 units.
    F. Around 65 units.

    *[Firm 1 will assume that $q_2 = 30$ and will plug this into its reaction function: $q_1 = 60 - 0.5q_2$ or $q_1 = 60 - 0.5 \cdot 30$ or $q_1 = 45]$*

11. According to scenario 5.1, the two firms collude but firm 1 alone decides to 'cheat', while it correctly believes that firm 2 will not cheat. What will the price be?

    A. Around $450.
    B. Around $550.
  77% C. **Around $650.**
    D. Around $750.
    E. Around $850.
    F. Around $950.

    *[Price will again be given by the demand curve: $p = 1,400 - 10 \cdot (45 + 30) = \$650]$*

12. According to scenario 5.1, the two firms collude but firm 1 alone decides to 'cheat', while it correctly believes that firm 2 will not cheat. By how much the profit of firm 1 will exceed that of firm 2?

    A. Around $3,000.
    B. Around $5,000.
  75% C. **Around $7,000.**
    D. Around $11,000.
    E. Around $13,000.
    F. Around $15,000.

    *[Profit for firm 1 is $(p - AVC) \cdot q - FC = (650 - 200) \cdot 45 - 1,000 = \$19,250$.*
    *Profit for firm 2 is $(p - AVC) \cdot q - FC = (650 - 200) \cdot 30 - 1,000 = \$12,500$.*
    *The difference in profits is $19,250 - 12,500 = \$6,750]$*

13. According to scenario 5.1, the two firms collude but they both 'cheat', while they both falsely believe that the other will not cheat. What will the price be?

    A. Around $100.
12% B. Around $250.
80% C. **Around $500.**
    D. Around $600.
    E. Around $800.

*[If they both cheat, they will each produce 45 because they each think that the other one will produce the collusive quantity (30). The price will be $p = 1,400 - 10 \cdot (45 + 45)$ or $p = 500$]*

14. According to scenario 5.1, the two firms collude but they both 'cheat', while they both falsely believe that the other will not cheat. What will the profit for each firm be?

    A. Around $9,000.
    B. Around $11,000.
75% C. **Around $13,000.**
    D. Around $15,000.
    E. Around $17,000.
    F. Around $19,000.

*[The profit for each firm will be $(p - AVC) \cdot q - FC = (500 - 200) \cdot 45 - 1,000 = \$12,500$]*

15. According to scenario 5.1, if firms compete with respect to price, what would the price be in the market?

    A. Around $0.
    B. Around $100.
94% C. **Around $200.**
    D. Around $300.
    E. Around $400.
    F. Around $500.

*[At Bertrand equilibrium firms set $p = MC$]*

16. According to scenario 5.1, if firms compete with respect to price, what would the profit be for each firm?

    A. Around -$2,000.
60% B. **Around -$1,000.**
34% C. Zero.
    D. Around $1,000.
    E. Around $2,000.
    F. We need more information to answer.

*[Same as in PC]*

17. According to scenario 5.1, if firms compete with respect to price, which of the following is accurate?

    A. Both firms would exit the market immediately. *[$AVC = p = \$200$, so neither firm has a reason to exit immediately because they cover the AVC]*
32% B. Both firms would exit the market in the long-run. *[With one firm, the market becomes a monopoly. The remaining firm will sell $q = 60$ for $p = \$800$ and make profit $(p - AVC) \cdot q - FC = (800 - 200) \cdot 60 - 1,000 = \$35,000$]*
36% C. Both firms would stay in business in the long run. *[No, because they will be making losses -$1,000]*
26% D. **Only one firm would exit the market in the long run.**

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18. ✓ Which of the following is most likely to be true for monopolistically competitive markets?

    81%**A.** **Firms can make profits in the S-R, but not in the L-R.**

    B. Firms can make profits in the L-R, but not in the S-R.

    17%C. Firms can make profits both in the S-R and in the L-R.

    D. Firms can make profits neither in the S-R nor in the L-R.

    *[Due to the absence of barriers of entry, monopolistically competitive firms cannot maintain their S-R profits in the L-R]*

19. ✓ Airlines industry is most likely to belong to which of the following market structures?

    A. Perfect competition.

    B. Monopolistic competition.

    91%**C.** **Oligopoly.**

    D. Monopoly.

    *[There are few airlines operating in each industry and companies behave strategically]*

20. Which of the following is LESS likely to be accurate for a market where the demand is kinked?

    A. Firms may neglect profit maximization to prevent price wars.

    49%B. Firms may produce quantities where $MR \neq MC$.

    35%**C.** **An increase in MC may not cause an increase in price.** *[If a firm realizes that it must increase its price in order to price maximize, this will not send a signal of price war to others. Kinked demand does not affect increases in price because those do not threaten the rivals]*

    D. Each individual firm's $MR$ is "broken" in two parts.