Homework 5 – KEY

Average: 87.38 + 0pts GI bonus

Due on 17/2/2026, by 23:00

The tasks in this assignment were designed for the average student to solve independently after mastering the material. The answers provided here are written in an instructional manner to help you understand the problem-solving process for each task. If you continue to struggle with a task after reviewing this key, the difficulty may stem not from the task itself, but from having missed or overlooked some parts of the required material.

1. Which of the following market structures is most likely to yield the lowest DWL? [9p]

    A.   A Monopoly.
    B.   A Cartel.
    C.   A Cournot Oligopoly.
    93% **D.   A Monopolistically Competitive market.**
    [Monopolistic Competition supplies the highest quantity at the lowest price relative to the other market structures, which results in the lowest DWL]

2. Which of the following is most likely to be true in a Cournot duopoly? [9p]

    A.   Firms do not strategically interact. *[When deciding its quantity supplied, each firm takes into account the other one's reaction function]*
    95% **B.   Firms could increase their profits if they both reduced quantities.** *[This would increase the market price and the firms' profits as well]*
    C.   There is no DWL in this duopoly. *[Cournot equilibrium brings about less than the socially optimal quantity]*
    D.   Long-run profits will be zero for both firms. *[Firms possess market power, which allows them to have positive profits]*
    E.   All of the above.

3. Which of the following is most likely to be true for a kinked-demand Oligopoly? [9p]

    13% **A.   Firms have pre-established some form of collusion.** *[Kinked-demand oligopoly assumes that there is some kind of fragile collusion established]*
    B.   Firms are willing to risk starting a price war. *[Actually, they try to avoid them]*
    C.   A change in marginal cost will immediately affect pricing. *[No, firms may prefer to keep price constant to not send the wrong signal to rivals]*
    D.   Rival firms have developed significant trust amongst each other. *[On the contrary, trust issues make the collusion fragile]*
    87% E.   None of the above.

4. Which of the following is most likely to be true for Monopolistically Competitive markets? [9p]

    98% **A.   Firms can have profits in the S-R, but not in the L-R.**
    B.   Firms can have profits in the L-R, but not in the S-R.
    C.   Firms can have profits both in the S-R, and in the L-R.
    D.   Firms can have profits neither in the S-R, nor in the L-R.
    [Profit can be non-zero in the S-R but entry will eliminate it in the L-R]

Scenario 5.1: Firm 1 and firm 2 share a market with demand $p = 2,000 - 10Q$, where Q denotes the total quantity sold in the market by both firms. Each firm's cost is $FC = 4,000$ and $MC = 200$.

5.✓ According to scenario 5.1, how much is the Cournot quantity <u>per firm</u>? [8p]

    A. Around 30 units.

100%B. **Around 60 units.**

    C. Around 90 units.

    D. Around 120 units.

    E. Around 150 units.

    F. Around 180 units.

    [We can solve this for the first firm as: $MR_1 = MC$ or $2,000 - 10q_2 - 20q_1 = 200$ or $20q_1 = 1,800 - 10q_2$ or $q_1 = 90 - 0.5q_2$, which is the optimal reaction function for firm 1. Since we know that at equilibrium $q_1 = q_2$, we can write $q_1 = 90 - 0.5q_1$ or $q_1 = 60$, which implies that $q_2 = 60$, as well]

6.✓ According to scenario 5.1, how much is the Cournot profit <u>per firm</u>? [8p]

    A. Zero.

    B. Around 12,000 dollars.

    C. Around 24,000 dollars.

93%D. **Around 32,000 dollars.**

    E. Around 36,000 dollars.

    F. Around 40,000 dollars.

    G. Around 48,000 dollars.

    [Price will be given by the demand curve: $p = 2,000 - 10 \cdot (60 + 60) = 800$. In addition, since MC is constant, every next unit costs the same and therefore AVC should be also constant and equal to the MC. So, profit can be calculated as $(p - AVC) \cdot q - FC = (800 - 200) \cdot 60 - 4,000 = 32,000]

7.✓ According to scenario 5.1, how much is the collusion quantity <u>per firm</u>? [8p]

99%A. **Around 45 units.**

    B. Around 70 units.

    C. Around 100 units.

    D. Around 130 units.

    E. Around 165 units.

    F. Around 200 units.

    [The $MR = 2,000 - 20Q$, must be equal to the MC. So, the total quantity will be $2,000 - 20Q = 200$ or $Q = 90$, which means that each firm will produce $q_1 = q_2 = 45]

8.✓ According to scenario 5.1, how much is the collusion profit <u>per firm</u>? [8p]

    A. Zero.

    B. Around 12,000 dollars.

    C. Around 24,000 dollars.

    D. Around 32,000 dollars.

95%E. **Around 36,000 dollars.**

    F. Around 40,000 dollars.

    G. Around 48,000 dollars.

    [Price can be calculated by the demand curve: $p = 2,000 - 10 \cdot 90$ or $p = 1,100$. So, collusion profit for each firm can be calculated as $(p - AVC) \cdot q - FC = (1,100 - 200) \cdot 45 - 4,000 = 36,500]

9. ✓ The two firms in scenario 5.1 agree to collude but firm 2 alone decides to cheat. How much will firm 2 produce? [8p]

    A. Around 45 units.

97% **B. Around 70 units.**

    C. Around 100 units.

    D. Around 130 units.

    E. Around 165 units.

    F. Around 200 units.

[Firm 2 will assume that $q_1 = 45$ and will plug this into its reaction function: $q_2 = 90 - 0.5q_1$ or $q_2 = 90 - 0.5 \cdot 45$ or $q_2 = 67.5$ is the optimal quantity for firm 2]

10. ✓ The two firms in scenario 5.1 agree to collude but firm 2 alone decides to cheat. How much will the profit for firm 2 be? [8p]

    A. Zero.

    B. Around 12,000 dollars.

    C. Around 24,000 dollars.

    D. Around 32,000 dollars.

    E. Around 36,000 dollars.

93% **F. Around 40,000 dollars.**

    G. Around 48,000 dollars.

[Price will again be given by the demand curve: $p = 2,000 - 10 \cdot (45 + 67.5) = 875$. So, profit for firm 2 is $(p - AVC) \cdot q - FC = (875 - 200) \cdot 67.5 - 4,000 = 41,562.50$]

11. ✓ The two firms in scenario 5.1 agree to collude but firm 2 alone decides to cheat. How much will the profit for firm 1 be, provided that it does not suspect that it will be cheated upon? [8p]

    A. Zero.

    B. Around 6,000 dollars.

    C. Around 13,000 dollars.

    D. Around 20,000 dollars.

95% **E. Around 26,000 dollars.**

    F. Around 33,000 dollars.

    G. Around 40,000 dollars.

[Profit for firm 1 is $(p - AVC) \cdot q - FC = (875 - 200) \cdot 45 - 4,000 = 26,375$]

12. ✓ The two firms in scenario 5.1 agree to collude but firm 2 alone decides to cheat. How much will the profit for firm 1 be, if it knows that firm 2 is going to cheat? [8p]

    A. Zero.

    B. Around 8,000 dollars.

    C. Around 15,000 dollars.

    D. Around 21,000 dollars.

78% **E. Around 28,000 dollars.**

14% F. Around 35,000 dollars.

    G. Around 42,000 dollars.

[Since firm 1 now knows that $q_2 = 67.5$, it will plug this into its reaction function: $q_1 = 90 - 0.5q_2$ or $q_1 = 90 - 0.5 \cdot 67.5$ or $q_1 = 56.25$ is the optimal quantity for firm 1. Price will again be given by the demand curve: $p = 2,000 - 10 \cdot (56.25 + 67.5) = 762.5$. So, profit for firm 1 is $(p - AVC) \cdot q - FC = (762.5 - 200) \cdot 56.25 - 4,000 = 27,640.63$]