

AP Microeconomics

Mock Exam

模拟考试

Aligned with College Board Official Standards

60 Multiple Choice + 3 Free Response Questions

With Full Answer Key & Scoring Guidelines

Total Time: 130 minutes | Max Score: 90 points

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AP Microeconomics Mock Exam

Exam Information / 考试说明

Section	Questions	Time	Weight	Notes
Section I: Multiple Choice	60	70 min	66%	No calculator allowed
Section II: Free Response	3	60 min	34%	Includes 10-min reading period; four-function calculator allowed

Free Response Structure:

- Q1 Long FRQ (recommended 25 min): Monopoly, profit maximization, price elasticity, labor market
- Q2 Short FRQ (recommended 12 min): Perfect competition, cost curves, long-run equilibrium
- Q3 Short FRQ (recommended 12 min): Game theory, payoff matrix, Nash equilibrium

Unit Coverage: Unit 1 (12-15%) | Unit 2 (20-25%) | Unit 3 (22-25%) | Unit 4 (15-22%) | Unit 5 (10-13%) | Unit 6 (8-13%)

Section I: Multiple Choice Questions

60 Questions | 70 Minutes | No Calculator

Unit 1: Basic Economic Concepts (Questions 1-8)

1. Which of the following best defines "scarcity" in economics?

- (A) Prices are too high for consumers to afford goods.
- (B) Society has limited resources and cannot satisfy all human wants.
- (C) A particular good is temporarily out of stock.
- (D) The government does not intervene enough in resource allocation.
- (E) Natural resources are being overexploited.

Basic

2. A student has 3 hours of free time. She can work as a tutor (earning \$20/hour), work at a restaurant (earning \$15/hour), or study. If she chooses to tutor, what is her opportunity cost of this decision?

- (A) \$60
- (B) \$45
- (C) \$15
- (D) \$105
- (E) Cannot be determined

Basic

3. A country's production possibilities curve (PPC) is bowed outward (concave to the origin). This indicates that:

- (A) Resources are not perfectly adaptable to producing different goods, resulting in increasing opportunity costs.
- (B) Opportunity costs are decreasing.
- (C) Opportunity costs are constant.
- (D) The economy is operating inefficiently.
- (E) The economy can achieve unlimited economic growth.

Medium

4. Country A can produce 1 unit of wheat in 2 hours and 1 unit of cloth in 4 hours. Country B can produce 1 unit of wheat in 3 hours and 1 unit of cloth in 6 hours. Which of the following is true?

- (A) Country A has an absolute advantage in both goods, so trade is unnecessary.
- (B) Country A has a comparative advantage in wheat, and Country B has a comparative advantage in cloth.
- (C) The opportunity costs are identical for both countries, so there is no basis for trade.
- (D) Country B has a comparative advantage in both goods.
- (E) Country A has a comparative advantage in cloth.

Medium

5. Which of the following would cause an entire outward shift of a country's production possibilities curve (PPC)?

- (A) A decrease in the unemployment rate.
- (B) An increase in government subsidies to a particular industry.
- (C) A technological advancement that improves productivity in all sectors.
- (D) The discovery of a natural resource that benefits only one industry.
- (E) A change in consumer preferences.

Basic

6. Country X can produce 1 ton of rice in 10 hours and 1 ton of cotton in 20 hours. Country Y can produce 1 ton of rice in 30 hours and 1 ton of cotton in 20 hours. For trade to be mutually beneficial, the terms of trade should be:

- (A) 1 ton of rice for 1 ton of cotton
- (B) 1 ton of rice for 1.5 tons of cotton
- (C) 1 ton of rice for 2 tons of cotton
- (D) 1 ton of rice for 3 tons of cotton
- (E) 1 ton of rice for 0.3 tons of cotton

Hard

7. Which of the following is NOT a characteristic of a market economy?

- (A) The price mechanism guides resource allocation.
- (B) Private property rights are protected.
- (C) Consumers and producers make decisions freely.
- (D) A central planning agency determines all production decisions.
- (E) Competition drives innovation and efficiency.

Basic

8. If an economy is operating on its PPC and wishes to increase the production of capital goods, then:

- (A) The production of consumer goods must decrease.
- (B) The PPC will immediately shift outward.
- (C) The economy must be experiencing unemployment.
- (D) The economy's efficiency has decreased.
- (E) Consumer goods production will also increase.

Medium

9. The law of demand states that, ceteris paribus:

- (A) As price increases, quantity demanded increases.
- (B) As price increases, quantity demanded decreases.
- (C) As price decreases, demand decreases.
- (D) An increase in demand causes price to decrease.
- (E) An increase in supply causes demand to decrease.

Basic

10. Which of the following would cause the demand curve for coffee to shift to the right?

- (A) A decrease in the price of coffee.
- (B) A decrease in the price of tea (a substitute good).
- (C) An increase in consumer income, assuming coffee is a normal good.
- (D) An increase in the cost of producing coffee beans.
- (E) A decrease in the number of coffee suppliers.

Basic

11. The demand function for a good is $Q_d = 100 - 2P$, and the supply function is $Q_s = 20 + 2P$. The equilibrium price and quantity are:

- (A) $P = \$20, Q = 60$
- (B) $P = \$15, Q = 70$
- (C) $P = \$25, Q = 50$
- (D) $P = \$10, Q = 80$
- (E) $P = \$20, Q = 80$

Medium

12. When the price increases from \$10 to \$12, the quantity demanded decreases from 100 to 80. Using the midpoint method, the price elasticity of demand in this range is:

- (A) 0.5
- (B) 1.0
- (C) 1.22
- (D) 2.0
- (E) 0.82

Medium

13. If the cross-price elasticity of demand between goods X and Y is -2, then:

- (A) X and Y are substitutes.
- (B) X and Y are complements.
- (C) X and Y are unrelated.
- (D) X is a normal good and Y is an inferior good.
- (E) The relationship between X and Y cannot be determined.

Medium

14. If the income elasticity of demand for a good is -0.5, the good is:

- (A) A luxury good (normal good)
- (B) A necessity (normal good)
- (C) An inferior good
- (D) A public good
- (E) A Giffen good

Medium

15. When demand is perfectly inelastic, the imposition of an excise tax on the good will result in:

- (A) Consumers bearing the entire tax burden.
- (B) Producers bearing the entire tax burden.
- (C) The tax burden being shared equally.
- (D) No deadweight loss being created.
- (E) Both A and D are correct.

Hard

16. If the government imposes a price ceiling below the equilibrium price, the result will be:

- (A) A surplus.
- (B) A shortage.
- (C) An increase in the equilibrium price.
- (D) An increase in supply.
- (E) A decrease in demand.

Basic

17. A minimum wage law is a classic example of a price floor. If the minimum wage is set above the equilibrium wage:

- (A) A labor shortage will occur.
- (B) A labor surplus (unemployment) will occur.
- (C) All workers' wages will decrease.
- (D) The demand for labor will increase.
- (E) Employment will increase.

Medium

18. At market equilibrium, consumer surplus is equal to:

- (A) The area below the demand curve and above the equilibrium price.
- (B) The area above the supply curve and below the equilibrium price.
- (C) The entire area between the demand curve and the supply curve.
- (D) The equilibrium price multiplied by the equilibrium quantity.
- (E) The entire area below the demand curve.

Medium

19. When demand is more elastic than supply, a \$5 per-unit tax on a good will result in:

- (A) Consumers bearing a larger share of the tax burden.
- (B) Producers bearing a larger share of the tax burden.
- (C) The tax burden being shared equally.
- (D) Consumers bearing the entire tax burden.
- (E) No deadweight loss being created.

Medium

20. Which of the following is a determinant of the price elasticity of demand?

- (A) The availability of substitutes.
- (B) The proportion of income spent on the good.
- (C) The time period available for adjustment.
- (D) Whether the good is a necessity or a luxury.
- (E) All of the above.

Basic

21. If demand for a good is inelastic, an increase in price will cause total revenue to:

- (A) Increase.
- (B) Decrease.
- (C) Remain unchanged.
- (D) First increase, then decrease.
- (E) Cannot be determined.

Medium

22. The government provides a \$3 per-unit subsidy to producers. In the new equilibrium:

- (A) The price consumers pay increases and the price producers receive decreases.
- (B) The price consumers pay decreases, the price producers receive increases, and the equilibrium quantity increases.
- (C) Both the price consumers pay and the price producers receive decrease.
- (D) The equilibrium quantity decreases.
- (E) No deadweight loss is created.

Hard

Unit 3: Production, Costs, and Perfect Competition (Questions 23-36)

23. The law of diminishing marginal returns occurs when:

- (A) All inputs are variable, in the long run.
- (B) At least one input is fixed, in the short run.
- (C) There are decreasing returns to scale.
- (D) All inputs are increased proportionally.
- (E) Fixed costs are decreasing.

Basic

24. Which of the following is a variable cost?

- (A) Factory rent.
- (B) Equipment depreciation.
- (C) Raw material costs.
- (D) Interest on long-term loans.
- (E) Fixed salaries for management.

Basic

25. When marginal cost (MC) is below average total cost (ATC):

- (A) ATC is increasing.
- (B) ATC is decreasing.
- (C) ATC is at its minimum point.
- (D) MC is increasing.
- (E) Fixed costs are decreasing.

Medium

26. A firm produces 100 units of output. Total fixed cost is \$500, and total variable cost is \$300.

The average total cost (ATC) and average variable cost (AVC) are:

- (A) $ATC = \$8$, $AVC = \$3$
- (B) $ATC = \$5$, $AVC = \$3$
- (C) $ATC = \$8$, $AVC = \$5$
- (D) $ATC = \$3$, $AVC = \$5$
- (E) $ATC = \$5$, $AVC = \$8$

Medium

27. When the long-run average total cost (LRATC) decreases as output increases, the firm is experiencing:

- (A) Constant returns to scale.
- (B) Economies of scale.
- (C) Diseconomies of scale.
- (D) Diminishing marginal returns.
- (E) Decreasing fixed costs.

Medium

28. The profit-maximizing rule for a firm is:

- (A) $MR = ATC$
- (B) $P = ATC$
- (C) $MR = MC$
- (D) $MC = ATC$
- (E) $P = MC$

Basic

29. Which of the following is NOT a characteristic of a perfectly competitive market?

- (A) A large number of buyers and sellers.
- (B) Homogeneous (identical) products.
- (C) Free entry and exit.
- (D) Firms are price makers (price setters).
- (E) Perfect information.

Basic

30. In a perfectly competitive market, the market price is \$15. At a certain output level, the firm's $ATC = \$12$, $AVC = \$10$, and $MC = \$15$. This firm is:

- (A) Earning positive economic profit and should continue producing.
- (B) Incurring a loss and should shut down immediately.
- (D) Earning zero economic profit.
- (E) In long-run equilibrium.

Medium

31. In long-run equilibrium under perfect competition:

- (A) $P > ATC$, and firms earn positive economic profit.
- (B) $P = ATC = MC$, and firms earn zero economic profit.
- (C) $P < ATC$, and firms exit the market.
- (D) $P = ATC > MC$.
- (E) $MR > MC$.

Medium

32. In the short run, a perfectly competitive firm's supply curve is:

- (A) The portion of the ATC curve above AVC .
- (B) The MC curve above the minimum of AVC .
- (C) The MC curve above the minimum of ATC .
- (D) The entire MC curve.
- (E) The entire ATC curve.

Medium

33. A perfectly competitive firm should shut down in the short run when:

- (A) $P < ATC$
- (B) $P < AVC$
- (C) $P < AFC$
- (D) $TR < TC$
- (E) $MR < MC$

Medium

34. A perfectly competitive firm has a total cost function of $TC = 100 + 10Q + Q^2$. When $Q = 5$, the marginal cost is:

- (A) \$10
- (B) \$15
- (C) \$20
- (D) \$25
- (E) \$35

Hard

35. In long-run equilibrium under perfect competition, which of the following is achieved?

- (A) Productive efficiency only.
- (B) Allocative efficiency only.
- (C) Both productive efficiency and allocative efficiency.
- (D) Economies of scale only.
- (E) None of the above.

Hard

36. Sunk costs in economic decision-making should be:

- (A) Carefully considered because they have already been spent.
- (B) Ignored because they cannot be recovered.
- (C) Treated as fixed costs.
- (D) Treated as variable costs.
- (E) Considered only in long-run decisions.

Hard

Unit 4: Imperfect Competition (Questions 37-47)

37. Which of the following is a characteristic of a monopoly?

- (A) There are many sellers in the market.
- (B) Products are homogeneous.
- (C) There are barriers to entry.
- (D) Firms are price takers.
- (E) Firms earn zero economic profit in the long run.

Basic

38. For a monopoly, the relationship between marginal revenue (MR) and the demand curve (D) is:

- (A) $MR = D$
- (B) MR lies below the D curve.
- (C) MR lies above the D curve.
- (D) MR is a horizontal line.
- (E) MR is unrelated to D.

Medium

39. A natural monopoly arises because:

- (A) The government grants a patent.
- (B) The firm controls a key resource.
- (C) Economies of scale are so significant that a single firm can supply the entire market at the lowest cost.
- (D) Market demand is too small.
- (E) Technological barriers are extremely high.

Medium

40. If a monopoly can practice perfect price discrimination:

- (A) Consumer surplus is zero and deadweight loss is zero.
- (B) Consumer surplus increases.
- (C) Output is lower than under a single-price monopoly.
- (D) Deadweight loss increases.
- (E) Profit decreases.

Medium

41. In long-run equilibrium under monopolistic competition:

- (A) $P = MC$, and firms earn zero economic profit.
- (B) $P > MC$, $P = ATC$, and firms earn zero economic profit.
- (C) $P > MC$, $P > ATC$, and firms earn positive economic profit.
- (D) $P = MC$, $P > ATC$.
- (E) Firms have excess capacity.

Medium

42. In long-run equilibrium under monopolistic competition, which of the following is true?

- (A) The firm produces at the minimum of ATC.
- (B) The firm produces to the left of the minimum of ATC, indicating excess capacity.
- (C) The firm produces to the right of the minimum of ATC.
- (D) The firm achieves allocative efficiency.
- (E) The firm achieves productive efficiency.

Medium

43. A defining characteristic of an oligopoly is:

- (A) Many firms producing homogeneous products.
- (B) A few firms with mutual interdependence.
- (C) Free entry and exit.
- (D) Firms are price takers.
- (E) Zero economic profit in the long run.

Basic

44. In game theory, a "dominant strategy" is:

- (A) A strategy that is optimal regardless of what the opponent chooses.
- (B) A strategy that maximizes the total payoff for both players.
- (C) The strategy played in a Nash equilibrium.
- (D) A strategy that minimizes one's own losses.
- (E) A strategy that the opponent cannot predict.

Medium

45. Two firms, A and B, have the following payoff matrix (the first number in each cell is A's profit, the second is B's):

	B: High Price	B: Low Price
A: High Price	(50, 50)	(10, 60)
A: Low Price	(60, 10)	(20, 20)

The Nash equilibrium of this game is:

- (A) (High Price, High Price)
- (B) (Low Price, Low Price)
- (C) (High Price, Low Price)
- (D) (Low Price, High Price)
- (E) There is no Nash equilibrium.

Medium

46. The game in Question 45 is an example of:

- (A) A coordination game.
- (B) A prisoner's dilemma.
- (C) A zero-sum game.
- (D) A sequential game.
- (E) A repeated game.

Hard

47. If oligopolistic firms successfully collude, they behave like:

- (A) Perfectly competitive firms.
- (B) Monopolistically competitive firms.
- (C) A monopoly.
- (D) Price takers.
- (E) A natural monopoly.

Medium

Unit 5: Factor Markets (Questions 48-54)

48. The demand for labor is a "derived demand," which means that:

- (A) Labor demand is determined by consumer preferences.
- (B) Labor demand is derived from the demand for the final product.
- (C) Labor demand is determined by labor unions.
- (D) Labor demand is constant and unchanging.
- (E) Labor demand is determined by government policy.

Basic

49. In a perfectly competitive labor market, the profit-maximizing condition for hiring workers is:

- (A) $MRP = \text{wage}$
- (B) $MP = \text{wage}$
- (C) $MFC = MP$
- (D) $TR = TC$
- (E) $\text{wage} = \text{price}$

Medium

50. A firm hires workers to produce a product that sells for \$5 per unit. The marginal product (MP) of the 3rd worker is 20 units. The marginal revenue product (MRP) of the 3rd worker is:

- (A) \$4
- (B) \$25
- (C) \$50
- (D) \$100
- (E) \$200

Medium

51. Which of the following would cause the labor demand curve to shift to the right?

- (A) An increase in the wage rate.
- (B) An increase in the demand for the product.
- (C) An increase in labor supply.
- (D) A decrease in worker productivity.
- (E) Technology replacing some labor.

Medium

52. In a perfectly competitive labor market, the firm's marginal factor cost (MFC) is equal to:

- (A) The marginal product.
- (B) The wage rate.
- (C) The product price.
- (D) Total revenue.
- (E) Marginal revenue.

Medium

53. In a monopsony labor market:

- (A) There are many employers competing for labor.
- (B) There is a single employer, and $MFC > \text{wage rate}$.
- (C) $MFC = \text{wage rate}$.
- (D) $MFC < \text{wage rate}$.
- (E) Workers have complete bargaining power.

Hard

54. If both the product market and the labor market are perfectly competitive, which of the following is correct?

- (A) $MRP = MP \times MR$
- (B) $MRP = MP \times P$
- (C) $MRP = \text{wage} \times P$
- (D) $MRP = MFC \times P$
- (E) Both B and A are correct (since $P = MR$ in a perfectly competitive product market).

Hard

Unit 6: Market Failure and Government Intervention (Questions 55-60)

55. A negative externality causes:

- (A) The market quantity to be less than the socially optimal quantity.
- (B) The market quantity to be greater than the socially optimal quantity.
- (C) The market quantity to equal the socially optimal quantity.
- (D) The market price to be higher than the socially optimal price.
- (E) No deadweight loss to be created.

Basic

56. The existence of a positive externality means that:

- (A) Social marginal benefit > private marginal benefit.
- (B) Social marginal cost > private marginal cost.
- (C) The market quantity is greater than the socially optimal quantity.
- (D) The good should be taxed.
- (E) The market price is higher than the socially optimal price.

Medium

57. The two key characteristics of public goods are:

- (A) Excludability and rivalry.
- (B) Non-excludability and non-rivalry.
- (C) Excludability and non-rivalry.
- (D) Non-excludability and rivalry.
- (E) Non-rivalry only.

Basic

58. A Pigouvian tax should be set such that:

- (A) The tax equals the amount of the external cost.
- (B) The tax equals the product price.
- (C) The tax equals the marginal benefit.
- (D) The tax is zero.
- (E) The tax equals the fixed cost.

Medium

59. Under asymmetric information, "adverse selection" occurs:

- (A) After a transaction, when one party changes behavior.
- (B) Before a transaction, when the party with more information exploits its advantage.
- (C) When market prices are too low.
- (D) When the government intervenes too much.
- (E) When consumers are fully informed about the product.

Hard

60. Common resources are characterized by:

- (A) Non-excludability and non-rivalry.
- (B) Non-excludability and rivalry.
- (C) Excludability and non-rivalry.
- (D) Excludability and rivalry.
- (E) They are identical to public goods.

Hard

Section II: Free Response Questions

3 Questions | 60 Minutes (including 10-min reading period) | Recommended: 25 min for Q1, 12 min each for Q2 & Q3

FRQ 1 (Long): Monopoly, Elasticity, and the Labor Market

Recommended Time: 25 minutes

SkyTech is the sole supplier (monopolist) in the market for premium drones. The table below shows its demand and cost information:

Quantity (Q)	Price (P)	Total Revenue (TR)	Marginal Revenue (MR)	Total Cost (TC)	Marginal Cost (MC)
0	\$100	\$0	—	\$50	—
1	\$95	\$95	\$95	\$100	\$50
2	\$90	\$180	\$85	\$140	\$40
3	\$85	\$255	\$75	\$180	\$40
4	\$80	\$320	\$65	\$230	\$50
5	\$75	\$375	\$55	\$300	\$70
6	\$70	\$420	\$45	\$390	\$90

(a) Concept Explanation

Explain why the monopolist's marginal revenue (MR) is less than the price (P) on its demand curve.

(b) Graphing

Draw a correctly labeled graph for SkyTech showing all of the following:

- The demand curve (D), marginal revenue curve (MR), marginal cost curve (MC), and average total cost curve (ATC), all correctly labeled
- The profit-maximizing quantity (Q^*) and price (P^*)
- The area of economic profit shaded in

(c) Calculations

Using the data from the table, calculate each of the following at SkyTech's profit-maximizing output:

- (i) The profit-maximizing quantity, Q^*
- (ii) The monopoly price, P^*
- (iii) The economic profit (or loss) at that quantity
- (iv) The price elasticity of demand between $Q = 3$ and $Q = 5$ using the midpoint method. State whether demand is elastic, inelastic, or unit elastic in this range.

(d) Perfect Price Discrimination

Suppose SkyTech is able to practice perfect price discrimination.

- (i) What will happen to the profit-maximizing quantity? Explain.
- (ii) What will happen to consumer surplus and deadweight loss?

(e) Labor Market

SkyTech hires engineers in a perfectly competitive labor market. The current wage for engineers is \$60 per hour. The table below shows the marginal product (MP) of each engineer SkyTech could hire:

Number of Engineers	MP (units/hour)	Product Price
1	10	\$8
2	8	\$8

3	6	\$8
4	4	\$8
5	2	\$8

- (i) Calculate the marginal revenue product (MRP) of each engineer.
- (ii) How many engineers should SkyTech hire to maximize profit? Explain your reasoning.
- (iii) If the wage increases to \$80 per hour, how will SkyTech's hiring decision change?

FRQ 2 (Short): Perfect Competition and Long-Run Equilibrium

Recommended Time: 12 minutes

The market for coffee beans is perfectly competitive. The current market price is \$12 per bag. GreenBean, a typical coffee bean producer, has the following total cost function:

$$TC = 50 + 4Q + 0.5Q^2 \quad (\text{where } Q \text{ is the quantity of coffee beans in bags})$$

(a) Graphing

Draw a correctly labeled side-by-side graph showing:

- Left panel — the coffee bean market: the market demand curve (D_{market}), market supply curve (S_{market}), equilibrium price (P^*), and equilibrium quantity (Q^*)
- Right panel — GreenBean: the firm's demand curve (which is also MR), the MC curve, and the ATC curve
- GreenBean's profit-maximizing quantity (Q_{firm})

(b) Calculations

- (i) Derive GreenBean's marginal cost function (MC).
- (ii) Calculate GreenBean's profit-maximizing quantity, Q^* .
- (iii) Calculate the ATC at the profit-maximizing quantity.
- (iv) Calculate GreenBean's economic profit or loss.

(c) Long-Run Adjustment

- (i) Based on your calculations in part (b), is GreenBean earning positive economic profit or incurring a loss in the short run?
- (ii) How will the market adjust in the long run? Describe the adjustment process.

- (iii) Draw or describe the characteristics of GreenBean's graph in long-run equilibrium (the relationship between P , ATC , and MC).

(d) Shutdown Decision

If the market price of coffee beans falls to \$5 per bag, should GreenBean continue to produce? Explain and state the shutdown condition.

FRQ 3 (Short): Game Theory and Nash Equilibrium

Recommended Time: 12 minutes

Two airlines, FlyHigh and SkyJet, compete on a particular route. Each firm can choose either a "High Price" or "Low Price" strategy. The payoff matrix is shown below (in millions of dollars; the first number in each cell is FlyHigh's profit, the second is SkyJet's):

	SkyJet: High Price	SkyJet: Low Price
FlyHigh: High Price	(\$80, \$80)	(\$20, \$100)
FlyHigh: Low Price	(\$100, \$20)	(\$50, \$50)

(a) Dominant Strategy Analysis

- (i) Does FlyHigh have a dominant strategy? If so, what is it? Explain.
- (ii) Does SkyJet have a dominant strategy? If so, what is it? Explain.

(b) Nash Equilibrium

What is the Nash equilibrium of this game? Explain your reasoning.

(c) Collusion Analysis

- (i) If the two firms collude (cooperate), which strategy combination would they choose?
- (ii) Why is the collusive outcome difficult to sustain in practice? (Hint: Analyze from the perspective of each firm's incentive to unilaterally deviate.)

(d) Game Classification

- (i) What type of game is this?
- (ii) If this game were repeated infinitely, would the cooperative outcome be more likely to be achieved? Briefly explain.

(e) Concept Explanation

Explain the meaning of "Nash equilibrium" and describe how it differs from a "dominant strategy equilibrium."

Part 2: Answer Key & Scoring Guidelines

MCQ Answer Key & Explanations / 选择题答案与解析

#	Ans	#	Ans	#	Ans	#	Ans	#	Ans
1	B	13	B	25	B	37	C	49	A
2	B	14	C	26	A	38	B	50	D
3	A	15	E	27	B	39	C	51	B
4	C	16	B	28	C	40	A	52	B
5	C	17	B	29	D	41	B	53	B
6	A	18	A	30	A	42	B	54	E
7	D	19	B	31	B	43	B	55	B
8	A	20	E	32	B	44	A	56	A
9	B	21	A	33	B	45	B	57	B
10	C	22	B	34	C	46	B	58	A
11	A	23	B	35	C	47	C	59	B
12	C	24	C	36	B	48	B	60	B

Detailed Explanations / 详细解析

Q1: B

稀缺性是指社会资源有限而人类欲望无限，无法满足所有需求的基本经济问题。价格高低只是稀缺性的表现形式之一，不是定义本身。

Q2: B

机会成本是放弃的次优选择的价值。做家教的次优选择是在餐厅打工， $3\text{小时} \times \$15 = \$45$ 。学习没有货币收益，不是次优选择。

Q3: A

PPC向外凸出表示机会成本递增，原因是资源不是同质的——某些资源更适合生产某种商品，转换生产时效率下降。

Q4: C

A国生产小麦的机会成本 $=2/4=0.5$ 单位布；B国 $=3/6=0.5$ 单位布。两国机会成本相同，不存在比较优势差异，因此没有贸易基础。虽然A国在两种商品上都有绝对优势（用时更少），但这并不意味着一定要贸易。

Q5: C

技术进步提高所有部门生产率使PPC整体外移。失业率下降只是在PPC内部移动（从内部到曲线上）。仅一个行业受益只使PPC一端外移。

Q6: A

X国大米的机会成本 $=10/20=0.5$ 吨棉花；Y国 $=30/20=1.5$ 吨棉花。互利贸易条件须介于两者之间： $0.5 < 1$ 吨大米换棉花 < 1.5 。选项A（1吨换1吨）在此范围内，双方均能受益。

Q7: D

政府中央计划机构决定所有生产决策是计划经济（命令经济）的特征，不是市场经济。

Q8: A

在PPC上运行意味着资源已充分利用。增加资本品产出必须减少消费品产出（PPC上的权衡取舍）。增加资本品产出可能在长期推动PPC外移，但这是结果而非即时效应。

Q9: B

需求定律：价格与需求量呈反向关系，价格上升需求量减少。注意区分"需求量变动"（沿曲线移动）和"需求变动"（曲线移动）。

Q10: C

收入增加使正常品的需求曲线右移。价格变动只引起沿曲线移动（需求量变动），不引起曲线移动。替代品价格下降会使需求左移。

Q11: A

令 $Q_d = Q_s$: $100 - 2P = 20 + 2P \rightarrow 80 = 4P \rightarrow P = 20$ 。代入得 $Q = 100 - 2(20) = 60$ 。均衡价格\$20，均衡数量60。

Q12: C

中点法: $E_d = [(80 - 100) / ((80 + 100) / 2)] / [(12 - 10) / ((12 + 10) / 2)] = (-20 / 90) / (2 / 11) = (-0.222) / (0.182) \approx -1.22$ 。取绝对值 ≈ 1.22 ，需求富有弹性。

Q13: B

交叉价格弹性为负意味着Y价格上升时X需求减少，说明X和Y是互补品。替代品的交叉弹性为正。

Q14: C

收入弹性为负意味着收入增加时需求减少，这是劣等品（inferior good）的定义。正常品收入弹性为正，奢侈品大于1。

Q15: E

需求完全无弹性时需求曲线是垂直的。税收完全由消费者承担（价格上升全额税额），且由于需求量不变，没有无谓损失。

Q16: B

价格上限低于均衡价格 $\rightarrow$ 价格被人为压低 $\rightarrow$ 需求量超过供给量 $\rightarrow$ 短缺。只有低于均衡价格的价格上限才是约束性的（binding）。

Q17: B

最低工资高于均衡工资 → 劳动力供给量超过需求量 → 出现失业（劳动力过剩）。注意：并非所有工人都受益，被解雇的工人反而受损。

Q18: A

消费者剩余 = 消费者愿意支付的最高价格（需求曲线）减去实际支付价格（均衡价格），即需求曲线以下、均衡价格以上的面积。

Q19: B

税负分担取决于弹性：弹性大的一方承担较少税负。需求弹性大于供给弹性意味着消费者更敏感（更容易逃避税收），所以生产者承担更多税负。

Q20: E

需求价格弹性的决定因素包括：替代品越多弹性越大、支出占比越大弹性越大、时间越长弹性越大、奢侈品比必需品弹性大。

Q21: A

需求缺乏弹性时，价格上涨的幅度大于需求量减少的幅度，总收益（ $P \times Q$ ）增加。反之，富有弹性时涨价使总收益减少。

Q22: B

补贴相当于负税收，使供给曲线右移（或需求曲线右移）。消费者支付的价格下降，生产者收取的有效价格上升，均衡数量增加。补贴也会产生无谓损失（过度生产）。

Q23: B

边际收益递减规律是短期现象：在至少一种投入固定的条件下，连续增加可变投入，其边际产量最终递减。长期中所有投入可变，不存在此规律。

Q24: C

可变成本随产量变化，原材料费用随产量增减而变化。其他选项均为固定成本，不随产量变动。

Q25: B

边际与平均的关系：当边际值低于平均值时，平均值递减（如同新加入的低分拉低平均分）。 $MC=ATC$ 时 ATC 达到最低点。

Q26: A

$ATC = TC/Q = (500+300)/100 = \$8$ 。 $AVC = VC/Q = 300/100 = \$3$ 。 $AFC = FC/Q = 500/100 = \$5$ 。 验证： $ATC = AFC + AVC = 5 + 3 = \$8$ ✓

Q27: B

$LRATC$ 随产量增加而递减 → 规模经济，即扩大规模降低平均成本。注意区分规模经济（长期概念）与边际收益递减（短期概念）。

Q28: C

利润最大化条件是 $MR=MC$ 。当 $MR>MC$ 时增加产量可增加利润；当 MR

Q29: D

完全竞争企业是价格接受者（price taker），不是价格制定者（price maker）。价格制定者是不完全竞争企业的特征。

Q30: A

$P=\$15 > ATC=\$12$ ，获得正经济利润。 $P > AVC$ （ $\$15 > \$10$ ），不会停产。 $MC=P=\$15$ 说明在利润最大化产量处。

Q31: B

完全竞争长期均衡：经济利润为零（ $P=ATC$ ），且在利润最大化产量处（ $P=MC$ ）。因此 $P=ATC=MC$ 。此时既实现生产效率（ $P=$ 最低 ATC ）又实现配置效率（ $P=MC$ ）。

Q32: B

完全竞争企业的短期供给曲线是MC曲线在AVC最低点以上的部分。价格低于AVC时企业停产，不供给。

Q33: B

停产条件： $P < AVC$ 。此时连可变成本都无法覆盖，继续生产亏损大于固定成本。 $P < ATC$ 但 $P > AVC$ 时应继续生产。

Q34: C

$MC = dTC/dQ = 10 + 2Q$ 。当 $Q=5$ 时， $MC = 10 + 2(5) = 10 + 10 = \$20$ 。

Q35: C

完全竞争长期均衡同时实现：①生产效率（ $P = \text{最低} ATC$ ，企业在最低成本下生产）；②配置效率（ $P = MC$ ，社会边际收益=社会边际成本）。这是完全竞争市场的重要福利含义。

Q36: B

沉没成本是已经支出且无法收回的成本，在理性决策中应被忽略。经济决策应基于边际分析（未来的边际成本和边际收益），而非过去无法改变的成本。

Q37: C

垄断市场的核心特征是存在进入壁垒（barriers to entry），阻止其他企业进入竞争。壁垒来源包括：规模经济（自然垄断）、专利/版权、控制关键资源、政府特许等。

Q38: B

垄断企业面对向下倾斜的需求曲线，要增加销量必须降低价格——不仅降低最后一单位的价格，还要降低之前所有单位的价格。因此每多卖一单位带来的边际收益低于该单位的价格，MR位于D下方。

Q39: C

自然垄断源于显著的规模经济：一家企业生产全部市场产量的平均成本低于多家企业分别生产。典型例子如自来水、电力配送等基础设施行业。

Q40: A

完全价格歧视下，企业对每个消费者收取其最高愿意支付的价格，消费者剩余全部转化为生产者剩余。产量增加到 $P=MC$ 处（与完全竞争相同），无谓损失为零。

Q41: B

垄断竞争长期均衡：因自由进入退出，经济利润为零（ $P=ATC$ ）。但因企业有一定定价权（产品差异化）， $P>MC$ 。同时存在excess capacity（ $P=ATC$ 但不在 ATC 最低点）。

Q42: B

垄断竞争长期均衡时，需求曲线与 ATC 相切在 ATC 下降段（ ATC 最低点左侧），说明企业未在最低平均成本处生产，存在过剩产能。既未实现生产效率也未实现配置效率。

Q43: B

寡头市场特征：少数几家企业主导市场，企业间相互依存——每家企业的利润不仅取决于自身决策，还取决于对手的决策。进入壁垒较高。

Q44: A

占优策略是指无论对手选择什么策略，该策略都是最优的。注意：占优策略均衡是比纳什均衡更强的概念——占优策略均衡一定也是纳什均衡，但纳什均衡不一定是占优策略均衡。

Q45: B

对A而言，B选高价时A选低价得 $60>50$ ，B选低价时A选低价得 $20>10$ ，低价是A的占优策略。同理对B，低价也是占优策略。纳什均衡为（低价，低价），双方各得20。但（高价，高价）各得50对双方更好——这是囚徒困境。

Q46: B

该博弈是囚徒困境：双方都有占优策略（低价），纳什均衡（低价，低价）的结果（各得20）劣于合作结果（高价，高价）（各得50），但单方面偏离合作有利可图，使合作不稳定。

Q47: C

寡头串谋后相当于一个垄断者，共同限制产量、提高价格、分享垄断利润。但串谋通常不稳定，因为每家企业都有暗自降价（欺骗）的激励。

Q48: B

劳动力需求是派生需求——它不是直接来自对劳动本身的欲望，而是来自对劳动所生产的产品需求。如果产品需求下降，劳动力需求也随之下降。

Q49: A

利润最大化雇工条件： $MRP = MRC$ （边际要素成本）。在完全竞争劳动力市场中 $MRC = \text{工资率}$ ，因此条件为 $MRP = \text{wage}$ 。当 $MRP > \text{wage}$ 时增雇工人有利可图；当 $MRP < \text{wage}$ 时应减少雇工。

Q50: D

$MRP = MP \times P$ （完全竞争产品市场） $= 20 \times \$5 = \$100$ 。如果第3个工人的 $MRP = \$100$ 大于工资，企业应继续增雇。

Q51: B

产品需求增加→产品价格上升→ $MRP(=MP \times P)$ 增加→劳动力需求曲线右移。工资变动只引起沿曲线移动。 MP 下降使 MRP 减少，曲线左移。

Q52: B

完全竞争劳动力市场中，企业是工资接受者，可以按市场工资率雇佣任意数量的劳动力，因此 $MFC = \text{工资率}$ （水平供给曲线）。

Q53: B

买方垄断是唯一的劳动力雇主。要增加雇佣必须提高工资——不仅对新雇工人，还要对所有工人。因此 $MFC > \text{工资率}$ （ MFC 曲线位于劳动力供给曲线上方）。买方垄断会雇佣少于竞争市场的劳动力数量。

Q54: E

在完全竞争产品市场中 $P=MR$ ，因此 $MRP=MP\times MR=MP\times P$ ，选项A和B都正确。选项E正确地指出在完全竞争产品市场中 $P=MR$ ，所以A和B等价。

Q55: B

负外部性（如污染）意味着社会边际成本(SMC) > 私人边际成本(PMC)。市场仅考虑私人成本，导致产量超过社会最优产量，产生无谓损失。

Q56: A

正外部性意味着社会边际收益(SMB) > 私人边际收益(PMB)。市场仅考虑私人收益，导致产量低于社会最优产量。解决方法是补贴而非征税。

Q57: B

公共物品具有非排他性（无法阻止他人使用）和非竞争性（一人使用不影响他人使用）。这导致搭便车问题，市场供给不足。

Q58: A

庇古税应等于外部成本（即社会边际成本与私人边际成本之差），使企业内化外部性，将产量减少到社会最优水平。

Q59: B

逆向选择发生在交易之前，信息一方利用信息优势（如二手车市场中卖方知道车况而买方不知道）。交易后的信息不对称问题称为道德风险（moral hazard）。

Q60: B

公共资源具有非排他性（无法阻止他人使用）但具有竞争性（一人使用减少他人可用量），如公共渔场、牧场。这导致"公地悲剧"（tragedy of the commons）——过度使用。

FRQ Scoring Guidelines / 自由回答题评分标准

FRQ 1 Scoring (Long Question, 14 points total)

(a) Explanation of $MR < P$ (2 points)

2 points: Correctly explains that a monopolist faces a downward-sloping demand curve, so to sell additional units it must lower the price. This price reduction applies not only to the last unit but to all previous units as well. Therefore, the marginal revenue from selling one more unit equals the price of that unit minus the revenue lost from lowering the price on all previous units, resulting in $MR < P$.

1 point: Mentions "downward-sloping demand curve" or "must lower price to sell more" but explanation is incomplete.

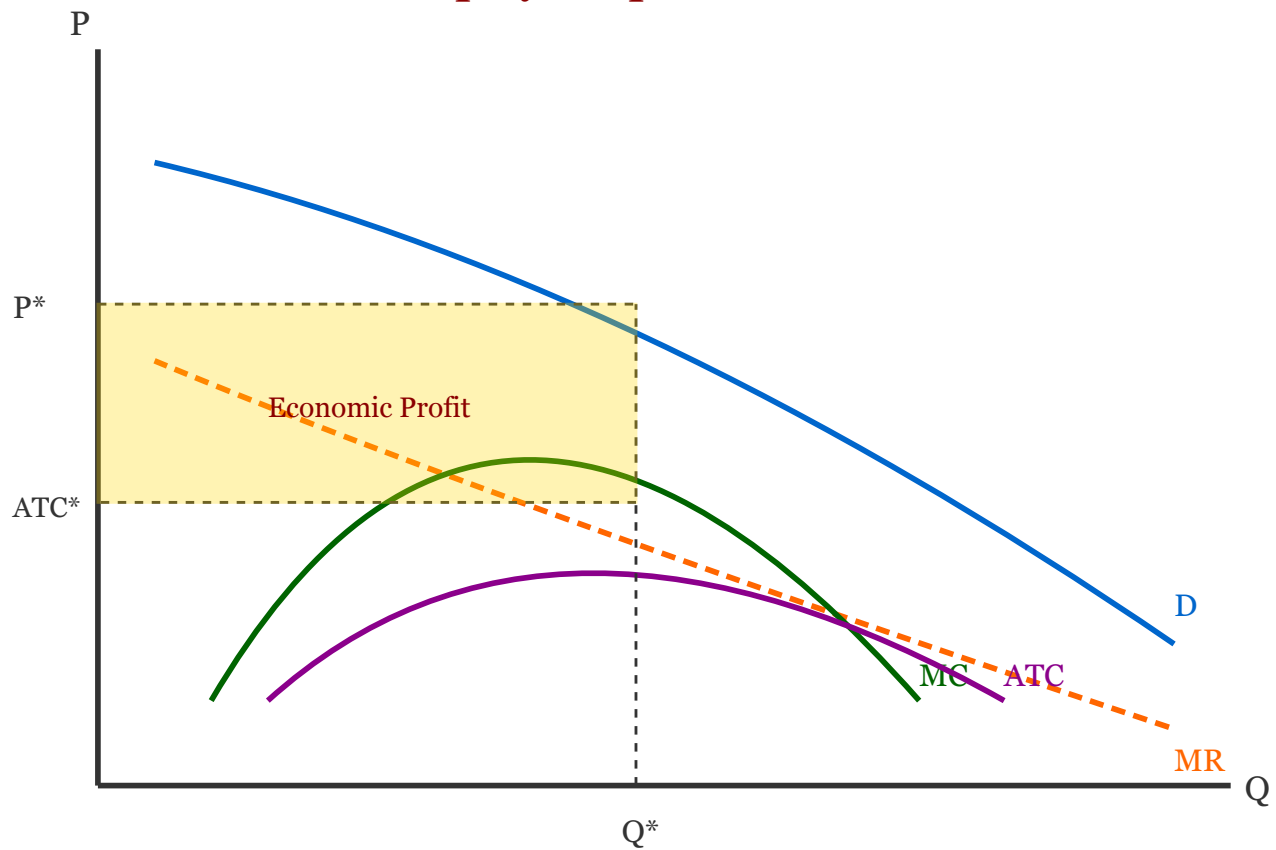
0 points: No valid explanation or incorrect reasoning.

(b) Graphing (4 points)

4 points (1 each):

- Correctly drawn downward-sloping D curve with MR below it; axes labeled (P on vertical, Q on horizontal)
- Correctly drawn U-shaped MC and ATC curves, with MC passing through the minimum of ATC
- Correctly identified Q^* (where $MR = MC$, projected to the horizontal axis) and P^* (from Q^* up to the demand curve, projected to the vertical axis)
- Correctly shaded the economic profit area (rectangle with height $(P^* - ATC^*)$ and width Q^*)

Monopoly Graph (Reference)



(c) Calculations (4 points)

(i) 1 point: $Q^* = 4$. At $Q=4$, $MR=\$65 > MC=\$50$ (should produce); at $Q=5$, $MR=\$55 < MC=\$70$ (should not produce). Comparing profits: $Q=4$ profit = $\$320 - \$230 = \$90$; $Q=5$ profit = $\$375 - \$300 = \$75$. $Q=4$ yields higher profit. **$Q^* = 4$**

(ii) 1 point: $P^* = \$80$ (the price on the demand curve at $Q=4$)

(iii) 1 point: Economic profit = $TR - TC = \$320 - \$230 = \mathbf{\$90}$. $ATC = \$230/4 = \$57.5$. Verify: $(P - ATC) \times Q = (80 - 57.5) \times 4 = \$90 \checkmark$

(iv) 1 point: Midpoint method: $Ed = [(375-255)/((375+255)/2)] / [(75-85)/((75+85)/2)] = (120/315) / (-10/80) = 0.381 / (-0.125) = -3.05$. $|Ed| \approx 3.05 > 1$, so demand is **elastic** in this range.

(d) Perfect Price Discrimination (2 points)

(i) 1 point: Output will increase to the level where $P = MC$ ($Q=6$). The monopolist can charge each consumer their maximum willingness to pay, so MR becomes the demand curve itself. The $MR=MC$ intersection occurs at a larger quantity. Profit increases.

(ii) 1 point: Consumer surplus decreases to zero (all converted to profit). Deadweight loss decreases to zero (output increases to the socially optimal level where $P = MC$).

(e) Labor Market (2 points)

(i) 0.5 point: $MRP = MP \times P$: 1st = \$80, 2nd = \$64, 3rd = \$48, 4th = \$32, 5th = \$16

(ii) 1 point: Hire 2 engineers. The 2nd engineer's $MRP = \$64 > \$60 = \text{wage}$, so should hire. The 3rd engineer's $MRP = \$48 < \$60 = \text{wage}$, so should not hire. **Hire 2 engineers.**

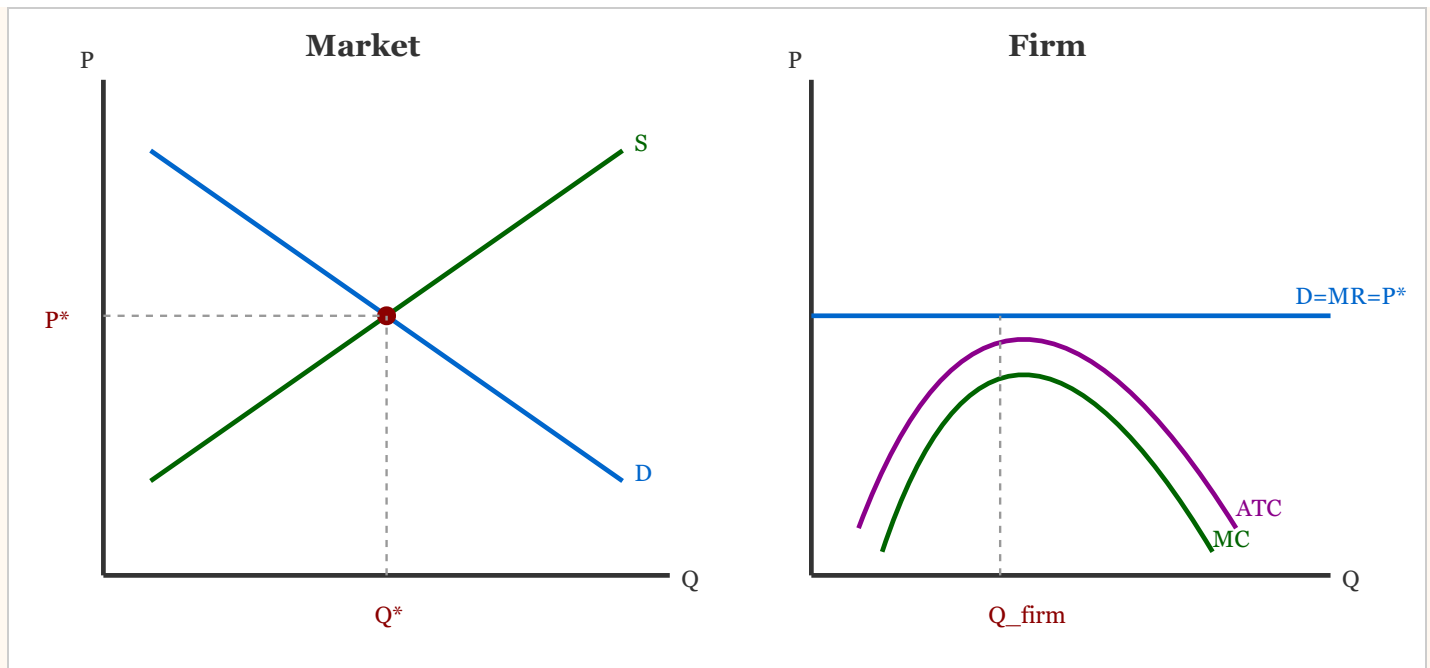
(iii) 0.5 point: When wage rises to \$80, only the 1st engineer has $MRP = \$80 \geq \$80 = \text{wage}$. The firm should hire 1 engineer (or 0, as the firm is indifferent at the margin). **Hire 1 or 0 (both acceptable).**

FRQ 2 Scoring (Short Question, 8 points total)

(a) Graphing (2 points)

2 points:

- Left panel — Market graph: downward-sloping D_{market} and upward-sloping S_{market} intersecting at equilibrium (P^* , Q^*), correctly labeled (1 point)
- Right panel — Firm graph: horizontal demand curve ($= MR = P^*$), U-shaped MC and ATC with MC passing through ATC minimum, Q_{firm} identified where $MR = MC$ (1 point)



(b) Calculations (3 points)

(i) 0.5 point: $MC = dTC/dQ = 4 + Q$

(ii) 1 point: In perfect competition, $P = MR$. Profit maximization: $MR = MC \rightarrow 12 = 4 + Q \rightarrow Q^* = 8$

(iii) 0.5 point: $ATC = TC/Q = (50 + 4 \times 8 + 0.5 \times 64)/8 = (50 + 32 + 32)/8 = 114/8 = \$14.25$

(iv) 1 point: Profit = $TR - TC = (12 \times 8) - 114 = 96 - 114 = -\$18$ (a loss of \$18). Alternatively: $(P - ATC) \times Q = (12 - 14.25) \times 8 = -\$18$

(c) Long-Run Adjustment (2 points)

(i) 0.5 point: GreenBean is incurring a loss in the short run (economic profit = $-\$18 < 0$).

(ii) 1 point: Since firms are losing money, some firms will exit the market. Firm exit $\rightarrow$ market supply decreases (S shifts left) $\rightarrow$ market price rises. This process continues until the price rises enough that remaining firms earn zero economic profit ($P = \text{minimum ATC}$).

(iii) 0.5 point: In long-run equilibrium: $P = ATC = MC$ (at the minimum of ATC). The demand curve (horizontal line) is tangent to the minimum of ATC, and firms earn zero economic profit.

(d) Shutdown Decision (1 point)

1 point: When $P = \$5$, compare P with AVC . $AVC = VC/Q = (4Q + 0.5Q^2)/Q = 4 + 0.5Q$. When $P = MC$: $5 = 4 + Q \rightarrow Q = 1$. At $Q = 1$, $AVC = 4 + 0.5(1) = \$4.5$. Since $P = \$5 > AVC = \$4.5$, **GreenBean should continue to produce** because revenue covers all variable costs and part of fixed costs. The shutdown condition is $P < AVC$.

FRQ 3 Scoring (Short Question, 7 points total)

(a) Dominant Strategy Analysis (2 points)

(i) 1 point: FlyHigh has a dominant strategy — Low Price. When SkyJet chooses High Price, FlyHigh earns \$100 (Low) > \$80 (High). When SkyJet chooses Low Price, FlyHigh earns \$50 (Low) > \$20 (High). Regardless of SkyJet's choice, Low Price is better for FlyHigh.

(ii) 1 point: SkyJet also has a dominant strategy — Low Price. By symmetric analysis: when FlyHigh chooses High Price, SkyJet earns \$100 (Low) > \$80 (High); when FlyHigh chooses Low Price, SkyJet earns \$50 (Low) > \$20 (High).

(b) Nash Equilibrium (1 point)

1 point: The Nash equilibrium is (Low Price, Low Price), where each firm earns \$50. Given that the other firm chooses Low Price, neither firm can improve its outcome by unilaterally switching to High Price (\$50 $\rightarrow$ \$20). No firm has an incentive to deviate.

(c) Collusion Analysis (2 points)

(i) 1 point: If the firms collude, they would choose (High Price, High Price), each earning \$80. This is better than the Nash equilibrium payoff of \$50 each — a Pareto improvement.

(ii) 1 point: The collusive outcome is unstable because unilateral deviation is profitable: if the other firm keeps High Price, deviating to Low Price earns $\$100 > \$80$. Each firm has an incentive to "cheat," making the collusive agreement difficult to sustain (prisoner's dilemma).

(d) Game Classification (1 point)

(i) 0.5 point: This game is a Prisoner's Dilemma. Both firms have a dominant strategy, and the Nash equilibrium outcome ($\$50$ each) is worse for both than the cooperative outcome ($\$80$ each).

(ii) 0.5 point: In an infinitely repeated game, cooperation is more likely to be sustained. Firms can use strategies like "tit-for-tat" to punish deviation, making the long-term benefit of cooperation exceed the short-term gain from betrayal.

(e) Concept Explanation (1 point)

1 point: A Nash equilibrium is a situation in which, given the strategies chosen by all other players, no player can improve their outcome by unilaterally changing their own strategy. A dominant strategy equilibrium is a stronger concept — a strategy that is optimal regardless of what the opponent does. A dominant strategy equilibrium is always a Nash equilibrium, but a Nash equilibrium is not necessarily a dominant strategy equilibrium (some games have Nash equilibria without dominant strategies).