LO.a: Describe characteristics of perfect competition, monopolistic competition, oligopoly, and pure monopoly.

1. A market structure characterized by many sellers of a homogeneous product, with no firm having any pricing power is *best* described as:
   A. monopolistic competition.
   B. oligopoly.
   C. perfect competition.

2. A market structure characterized by a single seller who has significant pricing power is *best* described as:
   A. monopoly.
   B. monopolistic completion.
   C. oligopoly.

3. A market structure characterized by few sellers and high barriers to entry into or exit from the industry is *best* described as:
   A. monopolistic competition.
   B. oligopoly.
   C. monopoly.

4. A market structure characterized by many sellers and high advertising and marketing expenditure is *best* described as:
   A. monopolistic competition.
   B. monopoly.
   C. oligopoly.

5. Advertising is *least likely* used in a:
   A. monopoly.
   B. monopolistic competition.
   C. perfect competition.

6. In which of the following cases is collusion *most likely* to occur?
   A. When the product is homogeneous.
   B. When there are many small companies in the industry.
   C. When the cost structures of companies are different.

7. An industry comprises of four firms that produce an easily replicable product. The barriers to entry are low. This industry is best characterized as:
   A. an oligopoly.
   B. monopolistic competition.
   C. perfect competition.

8. Indus Manufacturing is one of many companies in an industry. Indus produces widgets which are similar to those produced by its competitors up to the point they are labeled. The labeled

brand sells for £3.50 per unit. Other firms in the industry sell their products for £2.50 per unit. This industry is best characterized as:
A. monopoly.
B. monopolistic competition.
C. perfect competition.

9. Acme Enterprises operates in an industry with many sellers who differentiate their products. This industry is best characterized as:
A. oligopoly.
B. monopolistic competition.
C. perfect competition.

10. Zain Enterprises operates in an industry, which is characterized by a few sellers of a homogeneous product. The pricing decisions of the firms in this industry are interdependent. This industry is best characterized as:
A. monopolistic competition.
B. oligopoly.
C. perfect competition.

LO.b: Explain relationships between price, marginal revenue, marginal cost, economic profit, and the elasticity of demand under each market structure.

11. Which of the following statements about the demand schedules in perfect competition is *most* accurate?
A. The demand schedule faced by a firm is downward sloping, while the demand schedule faced by the market is horizontal.
B. The demand schedule faced by a firm is horizontal, while the demand schedule faced by the market is downward sloping.
C. The demand schedules faced by both the firm and the market are horizontal.

12. In a monopoly, a firm is operating at an average total cost of $15. The marginal cost is $10 which is equal to the marginal revenue. The firm produces 1000 units, charging a price of $25 per unit. The total profit of this firm is *closest* to:
A. $10,000.
B. $15,000.
C. $25,000.

13. Which of the following statements about monopolistic competition is *least* accurate?
A. The demand curve for a firm is downward sloping.
B. In equilibrium, price = marginal revenue = marginal cost.
C. In long-run equilibrium, economic profits are zero.

14. The following equations show the demand and cost curves for a company:
Demand curve: P = 135-5 * Q

Total revenue curve: $TR = 135 * Q – 5 * Q^2$
Marginal revenue curve: $MR = 135 – 15 * Q$
Total cost curve: $TC = Q^3 – 10 * Q^2 + 65 * Q + 110$
Average cost curve: $AC = Q^2 – 10 * Q + 65 + 110/Q$
Marginal cost curve: $MC = 20 * Q + 65$
The profit maximizing output for this firm is *closet* to:
A. 2.
B. 5.
C. 7.

15. The demand schedule in a perfectly competitive market is given by $P = 65 – 2.2Q$ (for $Q \leq 55$). The long-run cost structure of each company is:
Total cost: $243 + 3Q + 6Q^2$
Average cost: $243/Q + 3 + 6Q$
Marginal cost: $3 + 9Q$
New companies will enter the market at any price greater than:
A. 55.
B. 74.
C. 84.

LO.c: Describe a firm's supply function under each market structure.

16. Firms *most-likely* have a well-defined supply function under:
A. Oligopoly.
B. Monopoly.
C. Perfect competition.

17. Analyst 1: For firms operating under monopolistic competition, the supply curve is equal to the average cost curve.
Analyst 2: For firms operating under monopolistic competition, the supply curve is equal to the marginal cost curve.
Which analyst is *most likely* correct?
A. Analyst 1.
B. Analyst 2.
C. Neither.

LO.d: Describe and determine the optimal price and output for firms under each market structure.

18. A firm in a perfectly competitive market is operating at a price which is less than the average total cost, but it is more than the average variable cost. What is the *most* appropriate decision with respect to operating this firm?
A. The firm should be shut down as it is not able to recover average total cost.
B. The firm should continue its operations in the short run. This will minimize the losses.
C. The available details are insufficient to reach a decision.

19. A monopolist faces the following demand and cost schedules:

Output (units)	Price ($/unit)	Total Costs ($)
0	5,000	800
20	4,800	20,800
40	4,600	64,800
60	4,400	122,800
80	4,200	244,800
100	4,000	350,800

The optimal output level for this producer is *closest* to:
A. 40.
B. 60.
C. 80.

20. A firm in an industry characterized by monopolistic competition will *most likely* maximize profits when its output quantity is set such that the:
A. average cost is minimized.
B. marginal revenue equals marginal cost.
C. total cost is minimized.

LO.e: Explain factors affecting long-run equilibrium under each market structure.

21. Two dominant companies operating in the smart phone manufacturing industry agree not to reduce price below a certain limit. Based on whether or not each company honors the agreement, the possibilities are:

Possibilities	**Company A honors**	**Company A breaches**
Company B honors	Company A earns $1 million Company B earns $1 million	Company A earns $1.5 million Company B earns $0.5 million
Company B breaches	Company A earns $0.5 million Company B earns $1.5 million	Company A earns $0.7 million Company B earns $0.7 million

Considering game theory and Nash equilibrium, what will be the *most likely* outcome?
A. Company A will agree and B will breach the agreement.
B. Both companies will breach the agreement.
C. Both companies will honor the agreement.

22. Which of the following statements is *most accurate*?
A. Collusion is less likely when the product is homogeneous.
B. Collusion is less likely when the companies have similar market shares.
C. Collusion is less likely when the cost structures of companies are similar.

23. In a perfect competition, if companies are earning economic profit then over the long run the supply curve will *most likely*:
A. remain unchanged.
B. shift to the left.

C. shift to the right.

24. Analyst 1: Over time, the market share of the dominant company in an oligopolistic market will most likely increase.
Analyst 2: Over time, the market share of the dominant company in an oligopolistic market will most likely decrease.
Which analyst is correct?
A. Analyst 1.
B. Analyst 2.
C. Neither.

25. In a monopolistic market, consumer surplus decreases in the long run. This is *most likely* because of:
A. a reduction in quantity produced.
B. an increase in prices.
C. both a reduction in quantity produced and increase in prices.

26. Two analysts make the following statements:
Analyst 1: Compared to perfect competition, monopolies are always inefficient.
Analyst 2: Monopolies may sometimes be more efficient than perfect competition.
Which analyst is *most likely* correct?
A. Analyst 1.
B. Analyst 2.
C. Neither.

LO.f: Describe pricing strategy under each market structure.

27. If a monopoly is regulated by the government, it will *least likely* base its prices on:
A. marginal cost.
B. long run average cost.
C. first degree price discrimination.

28. Which of the following statements is *most* accurate?
A. An oligopolistic pricing strategy results in a kinked demand curve.
B. An oligopolistic pricing strategy results in a vertical demand curve.
C. An oligopolistic pricing strategy results in a horizontal demand curve.

29. Which of the following statements about perfect competition is *most* accurate?
A. In equilibrium, price < marginal revenue = marginal cost.
B. In equilibrium, price = marginal revenue = marginal cost.
C. In equilibrium, price > marginal revenue = marginal cost.

30. In first-degree price discrimination, the consumer surplus:
A. increases.
B. decreases.
C. is eliminated.

31. If a government regulates a monopoly through marginal cost pricing, it will *most likely* provide a subsidy to the monopoly when:
    A. marginal cost is below the average total cost.
    B. marginal cost is equal to the average total cost.
    C. marginal cost is above the average total cost.

32. Which of the following models *most likely* describes a situation in which no firm can increase profits by changing its price/output choice?
    A. Kinked demand curve model.
    B. Cournot model.
    C. Dominant firm model.

33. Engro is the price leader in its market. One of its competitors tries to gain market share by selling at a lower price set by Engro. The market share of Engro will *most likely*:
    A. decrease.
    B. increase.
    C. stay the same.

34. The market price of a dominant firm in an oligopolistic market is *most likely* based on the:
    A. market demand curve.
    B. demand curve faced by the dominant firm (price leader).
    C. demand curve faced by the other firms.

35. An airline segments customers into business travelers and leisure travelers. It then charges a higher price for the business segment. This is most likely an example of:
    A. first-degree price discrimination.
    B. second-degree price discrimination.
    C. third-degree price discrimination.

36. National Refinery of Pakistan is a monopoly enjoying very high barriers to entry. Its marginal cost is PKR 5,000 and its average cost is PKR 8,000. A recent market study has determined the price elasticity of demand to be 1.25. The company will *most likely* set its price at:
    A. 5,000.
    B. 8,000.
    C. 25,000.

LO.g: Describe the use and limitations of concentration measures in identifying market structure.

37. A market has 5 suppliers, each of them with 20 percent of the market. What are the concentration ratio and the HHI of the top three firms?
    A. Concentration ratio 6 percent and HHI 12.
    B. Concentration ratio 60 percent and HHI 1.2.
    C. Concentration ratio 60 percent and HHI 0.12.

38. The biggest limitation of N firm concentration ratio is that:
    A. the ratio is insensitive to mergers of two firms with large market share.
    B. the ratio is difficult to calculate and understand.
    C. the ratio is not useful for firms in monopolistic competition.

Refer to the below information for question 39-40
Below is the market share of firms in the FMCG industry. The market shares are before merger of A and B.
A – 30%
B – 20%
C – 15%
D – 15%
E – 10%
F – 10%

39. What is the 4-firm concentration ratio before and after merger?
    A. Before merger – 75%, after merger – 90%.
    B. Before merger – 80%, after merger – 90%.
    C. Before merger – 85%, after merger – 95%.

40. What is the 4-firm HHI before and after merger?
    A. Before merger – 0.170, after merger – 0.305.
    B. Before, merger – 0.175, after merger – 0.350.
    C. Before merger – 0.175, after merger – 0.305.

41. One of the disadvantages of the Herfindahl-Hirschmann index is that the index:
    A. is difficult to compute.
    B. fails to reflect the effect of mergers.
    C. fails to reflect low barriers to entry.

42. An analyst gathers the following market data for an industry:

Company	**Revenue (In million $)**
UBL	900
HBL	800
NBP	700
NIB	600
MCB	500
Others	400

    The industry's four-company concentration ratio is *closest* to:
    A. 67%.
    B. 77%.
    C. 83%.

43. An analyst has gathered the following data for an industry comprising of five firms:

Company	Market Share (%)
UBL	35
HBL	30
NBP	25
NIB	5
MCB	5

The industry's three-firm Herfindahl-Hirschmann Index is *closest* to:
A. 0.275.
B. 0.300.
C. 0.900.

LO.h: Identify the type of market structure within which a firm operates.

44. A firm operates in an industry with very low barriers to entry. The number of players in the market is high and they are competing with each other to provide goods at the lowest prices. None of the players have any pricing power. The *best* characterization of this firm's market is:
A. monopolistic competition.
B. perfect competition.
C. oligopoly.

45. A firm operates in an industry where the barriers to entry are comparatively low. Its competitors offer substitute products, but with differentiated features, quality and pricing. The firm has some pricing power, but it is low due to high number of substitutes and high number of competitors. The *best* characterization of this firm's market is:
A. oligopoly.
B. monopolistic competition.
C. perfect competition.

46. A firm operates in an industry with very few players. The barriers to entry are high and the firm has significant pricing power. The *best* characterization of this firm's market is:
A. monopoly.
B. monopolistic competition.
C. oligopoly.

47. A firm operates in an industry where the average cost of production is falling over the relevant range of consumer demand. The barriers to entry are very high and the firm has significant pricing power. The *best* characterization of this firm's market is:
A. monopoly.
B. oligopoly.
C. monopolistic competition.

Solutions

1. C is correct. Characteristics of perfect competition include many sellers, homogeneous products and firms have no pricing power.

2. A is correct. In a monopoly, we have a single seller who has significant pricing power.

3. B is correct. In an oligopoly, we have relatively few sellers and the barriers to entry into or exit from the industry are high.

4. A is correct. In monopolistic competition, we have many sellers, the products are differentiated and the advertising and marketing expenses are high.

5. C is correct. In perfect competition, the product cannot be differentiated by advertising or any other means.

6. A is correct. Collusion is more likely when companies have homogeneous products.

7. C is correct. Even though there are only four firms in the industry, the barriers to entry are low. This implies that other firms are voluntarily not entering the industry, making this most likely a perfectly competitive environment.

8. B is correct. There are many competitors in the market, but there is evidence of branding and product differentiation. These are characteristics of monopolistic competition.

9. B is correct. Product differentiation is the most distinctive factor in monopolistic competition

10. B is correct. Oligopoly markets are characterized by a small number of firms that dominate the market. There are so few firms in the relevant market that their pricing decisions are interdependent.

11. B is correct. The demand schedule faced by a firm is horizontal, while the demand schedule faced by the market as a whole is downward sloping.

12. A is correct. The firm is selling at $25 and the average total cost is $15. The firm is making a profit of $10 per unit. This will result in a total profit of $10,000.

13. B is correct. For monopolistic completion, price > marginal revenue = marginal cost (in equilibrium).

14. A is correct. The profit will be maximum, when MR = MC.
    $135 – 15 * Q = 20 * Q + 65$. Solving, we get $Q = 2$

15. C is correct. The long-run competitive equilibrium occurs where MC = AC = P for each company.
    By equating MC and AC,

$3 + 9Q = 243/Q + 3 + 6Q$
$3Q + 9Q^2 = 243 + 3Q + 6Q^2$
$3Q^2 = 243$
$Q = 9$
The equilibrium price can be found by using the following equation: P = 3 + 9Q = 84.
Any price above 84 yields an economic profit because P = MC > AC, so new companies will enter the market. Note that the demand curve for the market is not needed for this problem.

16. C is correct. Under perfect competition, the supply function is well defined and is equal to the marginal cost schedule of the firm.

17. C is correct. Firms operating under monopolistic competition do not have well-defined supply functions, so neither the marginal cost curve nor the average cost curves are supply curves in this case.

18. B is correct. In perfect competition, if the firm is operating where price is less than average total cost and more than average variable cost; the firm is recovering all variable cost and some part of fixed cost. In this scenario, it is best to continue operations in short run, which will minimize the losses.

19. B is correct. The optimal price level is 60 units because it produces the highest profit.

Output (units)	**Price ($/unit)**	**Total Revenue ($)**	**Total Costs ($)**	
20	4,800	96,000	20,800	75,200
40	4,600	184,000	64,800	119,200
60	4,400	264,000	122,800	**141,200**
80	4,200	336,000	244,800	91,200
100	4,000	400,000	350,800	49,200

20. B is correct. The profit maximizing choice is the level of output where marginal revenue equals marginal cost.

21. B is correct. Based on game theory and the available information, it is most likely that both companies will breach the agreement.

22. B is correct. When companies have similar market shares, competitive forces tend to outweigh the benefits of collusion.

23. C is correct. The economic profit will attract new entrants to the market and encourage existing companies to expand capacity.

24. B is correct. The dominant company’s market share tends to decrease as profits attract entry by other companies.

25. C is correct. In monopoly, in the long run, consumer surplus is reduced because of reduction in quantity produced and increase in prices.

26. B is correct. Economies of scale and regulation may sometimes make monopolies more efficient than perfect competition.

27. C is correct. Government regulation may attempt to improve resource allocation by requiring the monopolist to institute average cost pricing or marginal cost pricing. The monopolist will least likely be allowed to institute first degree price discrimination.

28. A is correct. Under an oligopolistic pricing strategy, competitors will not follow a price increase but will cut their prices in response to a price decrease by a competitor. Hence the demand curve is kinked.

29. B is correct. In perfect competition, at equilibrium, price = marginal revenue = marginal cost.

30. C is correct. In first degree price discrimination, the entire consumer surplus is captured by the producer. The consumer surplus falls to zero.

31. A is correct. Under marginal cost pricing, a subsidy is provided to the monopolist if MC < ATC.

32. B is correct. The Cournot model describes a special case of Nash equilibrium, in which no firm can increase profits by changing its price/output choice.

33. B is correct. As prices decrease, smaller firms will leave the market rather than sell below cost. The most likely scenario is that Engro (market leader) will decrease prices and its market share will increase.

34. B is correct. The dominant company determines its profit maximizing quantity by equating its marginal revenue and marginal cost. The price is then set based on the dominant company's demand curve.

35. C is correct. *In first-degree price discrimination,* a company is able to charge each customer the highest price the customer is willing to pay. *In second-degree price discrimination,* a company offers a menu of quantity-based pricing options designed to induce customers to self-select based on how highly they value the product. The scenario given in the question is an example of third-degree price discrimination where customers are segregated by demographic or other traits.

36. C is correct. Profits are maximized when MR = MC. For a monopoly:

$$\mathrm{MR} = \mathrm{P}\left(1 - \frac{1}{\text{Price Elasticity}}\right)$$

$$5000 = \mathrm{P}\left(1 - \frac{1}{1.25}\right)$$

$$\mathrm{P} = 25000$$

37. C is correct. The concentration ratio for the top three firms is 20 + 20 + 20 = 60 percent.
The HHI is $0.20^2 * 3 = 0.12$

38. A is correct. The biggest limitation of N firm concentration ratio is that it is insensitive to mergers of two firms with large market shares. Hence, it does not give the right result in this type of situations.

39. B is correct. The 4-firm concentration ratio before merger is 30 + 20 + 15 + 15 = 80%. After merger of A and B, the ratio will be 50 + 15 + 15 + 10 = 90%. This industry is highly concentrated.

40. B is correct. Before merger 4-firm HHI = $0.30^2 + 0.20^2 + 0.15^2 + 0.15^2 = 0.175$
After merger 4-firm HHI = $0.50^2 + 0.15^2 + 0.15^2 + 0.10^2 = 0.305$

41. C is correct. The HHI does not reflect low barriers to entry that may restrict the market power of companies currently in the market.

42. B is correct. The top four companies in the industry comprise 77% percent of industry sales:
$$\text{Concentration Ratio} = \frac{900 + 800 + 700 + 600}{900 + 800 + 700 + 600 + 500 + 400} = 77\%$$

43. A is correct. The three-firm Herfindahl-Hirschmann Index is $0.35^2 + 0.30^2 + 0.25^2 = 0.275$.

44. B is correct. These characteristics represent perfect competition.

45. B is correct. These characteristics represent monopolistic competition.

46. C is correct. These characteristics represent oligopoly.

47. A is correct. These characteristics represent monopoly.