P1/4

Hints only; students need to write detailed answers.

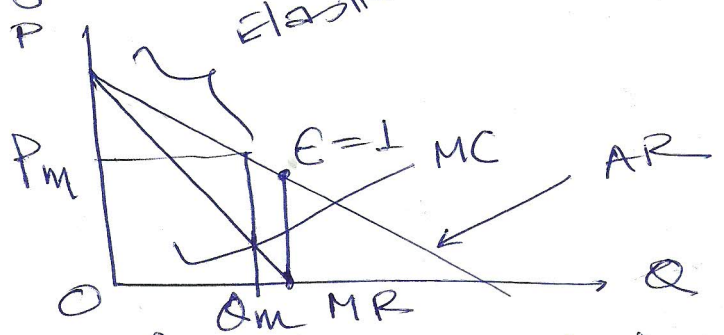
Part A

1. **(3*2=6 marks)** State whether you agree or disagree with each of the following statements. Using appropriate **diagrams, explain** your response (marks will depend on the explanation).

   a. A profit maximizing monopolist must operate on the elastic portion of the demand curve.

   b. Supply curve of a firm under competition is its entire marginal cost curve.

(a) Agree.

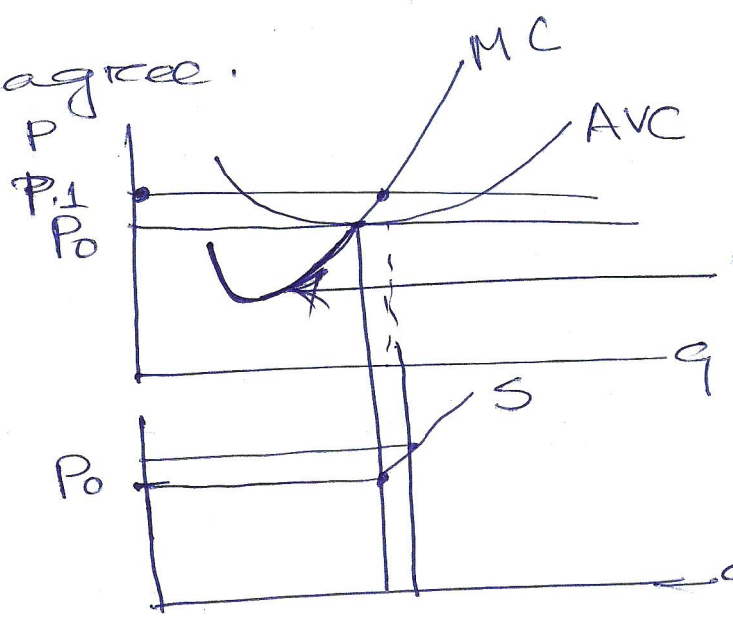


FOC of Profit maximization:

$MC = MR$

For any positive mc ($MC > 0$), monopolist must operate to the left of $\epsilon=1$ on the demand (AR) Curve.

(b) Disagree.



MC below AVC is not part of the supply Curve.

B 2/4

2. **(3*4=12 marks)**

a. Using the appropriate assumptions and diagrams, **explain** why a firm's demand curve under competition is horizontal.

b. What is deadweight loss? Using diagrams, **explain** how a monopolist creates a deadweight loss. Page 372, Fig 11.5

c. A firm's short runt total cost curve is: $C = 200 + 4q + 2q^2$.

i) Find the supply equation of the firm.

ii) If there are 10 identical firms, find the equation of the market supply curve, and show it on a diagram. If P=$80, find the quantity supplied by the market.

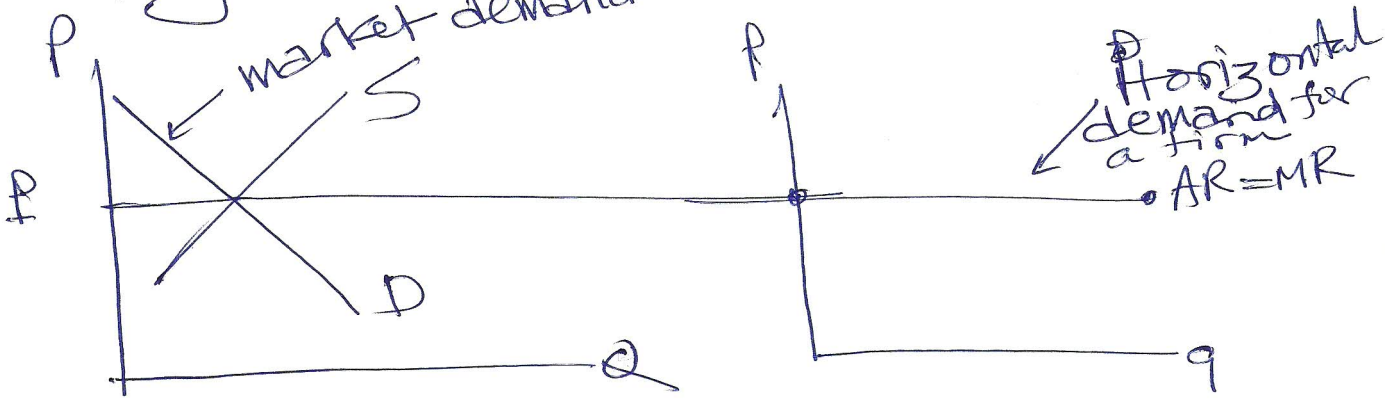
d. The demand and cost functions for Wayless (monopolist), a dietary supplement, are as follows

$$p = 40 - Q; \qquad C(Q) = 50 + Q^2$$

i. Calculate profit maximizing price, quantity along with the firm's profit.

ii. What output would be produced under perfect competition assuming no change in costs? Calculate the deadweight loss due to monopoly.

(a) Assumptions; (Page 244)
Very Large number of small (producers) firms - ...; a firm is a price taker. Market price is set by the aggregate demand and aggregate supply of the product.



One firm is so insignificant, it cannot change the Price (set by the market).

2.c

$C = 200 + 4Q + 2Q^2$

1. Supply equation:

$MC = P$

$4 + 4Q = P$

$4Q = -4 + P$

$Q = -1 + \frac{1}{4}P$

10 firms supply:

$\sum_{i=1}^{10} Q_i = 10\left[-1 + \frac{1}{4}P\right]$

Market Supply: $Q = -10 + 2.5P$

if $P = \$80$, $Q_S = -10 + 2.5(80)$

$= 190$ units

d (i) $P = 40 - Q$

$MR = 40 - 2Q$

$C = 50 + Q^2$

$MC = 2Q$

$\therefore MC = MR$

$2Q = 40 - 2Q$

$4Q = 40$

$Q = 10$ units

$P = 40 - 10 = \$30$

$\pi = 40(30) - [50 + 100]$

$= \$150$

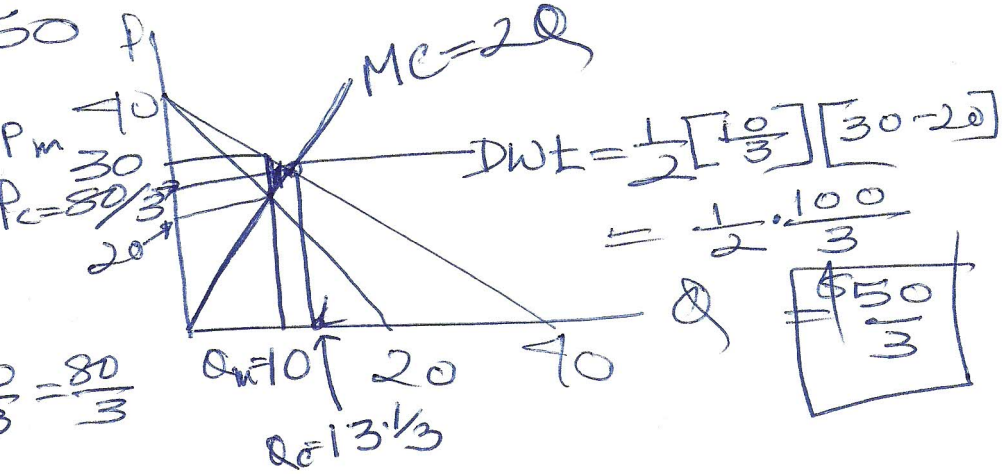
(ii) $MC = AR$

$2Q = 40 - Q$

$3Q = 40$

$Q = 13\frac{1}{3}$

$P = 40 - \frac{40}{3} = \frac{80}{3}$



$DWL = \frac{1}{2}\left[\frac{10}{3}\right][30 - 20]$

$= \frac{1}{2} \cdot \frac{100}{3}$

$= \frac{\$50}{3}$

P4/4

Part B

1. The monopoly maximizes profit by setting
A) price equal to marginal cost.
B) price equal to marginal revenue.
C) marginal revenue equal to marginal cost.
D) marginal revenue equal to zero.

2) A horizontal demand curve for a firm implies that
A) the firm is a monopoly.
B) the market the firm is operating in is not competitive.
C) the firm is selling in a competitive market.
D) the products of that firm are very different from other firms' poducts.

3) If a competitive firm finds that it maximizes short-run profits by shutting down, which of the following must be true?
A) p < AVC for all levels of output.
B) p < AVC only for the level of output at which p = MC.
C) p < AVC only if the firm has no fixed costs.
D) The firm will earn zero profit.

4) Suppose $TC = 10 + 0.1q^2$. If p = 10 for any amount, the firm's profits will be
A) 240. B) 250.
C) 260. D) -10 because the firm will shut down.

5) A monopoly sets a price of $50 per unit for an item that has a marginal cost of $10. Assuming profit maximization, the implicit demand elasticity is
A) -0.2. B)-0.8.
C) -1.25. D) -5.0.

6) If the inverse demand curve a monopoly faces is p = 100 - 2Q, and MC is constant at 16, then profit maximization is achieved when the monopoly sets price equal to
A) 16. B) 21. C) 25. **D) 58.**

7) If the government attempts to force a natural monopoly to charge a price equal to marginal cost
A) the natural monopoly will shut down.
B) the natural monopoly will still make high profits.
C) the natural monopoly's marginal cost curve will shift up.
D) the natural monopoly will not make a loss.