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$$(1) \quad P = 24 - Q \quad , \quad C(Q) = Q^2 + 12$$

$$MC = 2Q$$

$$PQ = 24Q - Q^2$$

$$TR = 24Q - Q^2$$

$$MR = 24 - 2Q$$

$$MR = MC$$

$$24 - 2Q = 2Q$$

$$4Q = 24$$

$$Q = 6$$

$$P = 24 - 6$$

$$= 18$$

$$\frac{24}{6}$$

$$\pi = TR - TC$$

$$= 24Q - Q^2 - (Q^2 + 12)$$

$$= 24Q - Q^2 - Q^2 - 12$$

$$= 24Q - 2Q^2 - 12$$

$$= 144 - 12 - 72$$

$$= 144 - 84$$

$$= 60$$

$$\text{Consumer Surplus} = \int_{P_m}^P \Delta$$

$$P = 24$$

$$\frac{1}{2} (24 - 18) \times 6 = \frac{1}{2} \times 6 \times 6 = \frac{36}{2}$$

$$= 18$$

$$2P = 70$$

$$P = 35$$

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$$(2) \quad Q = 100 - 2P, \quad MC = 5 + 0.5Q$$

$$PQ = 100P - 2P^2$$

$$P = MC$$

$$50 - \frac{Q}{2} = 5 + \frac{Q}{2}$$

$$2P = 100 - Q$$

$$45 = Q$$

$$P_{PC} = 27.5$$

$$P = \frac{100 - Q}{2}$$

$$50 - \frac{Q}{2} = 5 + \frac{Q}{2}$$

$$P = 50 - \frac{Q}{2}$$

$$PQ = 50Q - \frac{Q^2}{2}$$

$$50Q - 10Q = 5 + 5Q$$

$$15Q = 49.5$$

$$= 3.3$$

$$TR = 50Q - \frac{Q^2}{2}$$

$$MR = 50 - Q$$

$$50 - Q = 5 + 0.5Q$$

$$1.5Q = 45$$

$$Q = 30$$

Society loss =

$$\frac{1}{2} (Q_{PC} - Q_M) \times (P_M - P_{PC})$$

$$= \frac{1}{2} [45 - 30] [40 - 27.5] = \frac{1}{2} \times 15 \times 12.5 = 93.75$$

(3)

$$MC = ₹10 / \text{breed}$$

$$Q = 1000 - 50P$$

$$TR \Rightarrow P = \frac{200 - Q}{10}$$

$$= 20 - \frac{Q}{10}$$

$$(10 - 2) = \frac{Q}{25}$$

$$200 - \frac{Q^2}{50}$$

$$Q = 25 \times 8 = 200$$

$$MR = 20 - \frac{Q}{25}$$

$$Q_M = 200, \quad P_M = 20 - 4 = 16$$

$$P_C = P = MR = MC$$

$$20 - \frac{Q}{50} = 10$$

$$\frac{Q}{50} = 10$$

$$Q = \underline{500} \quad P_C = 20 - 10 = \underline{10}$$

$$(ii) (Q_P - Q_M)(P_M - P_C)$$

$$= (500 - 200)(16 - 10)$$

$$= 300 \times 6 = 1800$$

$$= 1800$$

$$(4) \quad P = 36 - 2Q \quad AV = Q^2 - 18Q + 100$$

$$Profit = 0$$

$$\frac{100}{2} = 50$$

$$\frac{32}{2} = 16$$

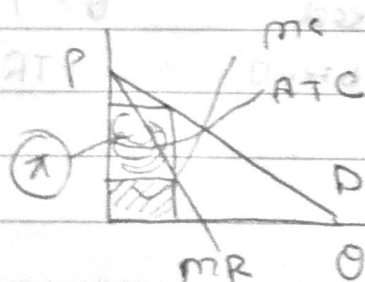
$$16 \times 4 = 64$$

$$4 \times 16 = 64$$

$$4 \times 8 = 32$$

$$Q = 8$$

$$(0)$$



Short Run -

$$MR = MC$$

Long Run -

$$P = AVC$$

$$(b)$$

