BACHELOR OF ARTS EXAMINATION, 2022

(2nd Year, 4th Semester)

ECONOMICS

MICROECONOMICS II

Time : Two hours | Full Marks : 30

Answer any five of the following questions. $6 \times 5 = 30$

1. Suppose a monopolist produces a good X which is used as the only input for producing two different final goods Y and Z. Assume that one unit of X is required to produce one unit of both Y and Z. Assume also that the firms operating in Y and Z industries are perfectly competitive and the demand elasticities for Y and Z are ε_Y and ε_Z, respectively, with $\varepsilon_Y < \varepsilon_Z$.

   (a) Supposing there is no resale of X, what will the prices of Y and Z be? 2

   (b) Suppose it is not possible for the monopolist to stop resale of X. Is it still possible for the monopolist to maintain a price difference between goods Y and Z? 4

2. Consider a monopolist with cost function $C(q) = cq$, $c > 0$; facing a sequence of demand functions $q(p) = \alpha p^{-\varepsilon}$, $\varepsilon > 1$; which differ in their levels of ε and α but all of which involve the same competitive quantity (i.e., for each level of ε, α is adjusted to keep output at the level of the competitive outcome). How does deadweight loss vary with ε?

3. A monopolist is facing a demand function $p = a - Q$ and her unit production cost is $c > 0$. Suppose the government imposes a tax t per unit of output sold to consumers.

   (a) Show that imposition of tax will raise the price paid by consumers by less than t. 3

   (b) Will the above answer change if market demand has constant elasticity: $p = Q^{-2}$? 3

4. Consider the Cournot duopoly model where inverse demand function is $P(Q) = a - Q$, but firms have asymmetric marginal costs: c_1 and c_2. What is a Nash equilibrium if $0 < c_i < a/2$ for each firm? What if $c_1 < c_2 < a$ but $2c_2 > a + c_1$?

3+3

5. The long run equilibrium proportional demand curve of a firm in a monopolistically competitive industry is $p = 51 - 2q$ and the average cost is $q^2 - 16q + 100$. What are the equilibrium price and quantity for this firm? Derive the equilibrium linear perceived demand curve of the firm. 1.5×4

6. A good is to be sold to a player in the set $P = \{1, 2, \ldots, n\}$. The valuation of the good to player i ($i \in P$) is v_i with $v_1 > v_2 > \ldots > v_n > 0$ and all of this is common knowledge. The players simultaneously and privately submit bids (nonnegative numbers) and the good is given to the player with the lowest index among those who submit the highest bid (e.g. if players 4 and 5 jointly submit the highest bid then 4 wins), in exchange for a payment. The payment that the winner makes is the price that he bids, so that the payoff to i is $u_i = v_i - b_i$ should i be the winner where b_i is the bid of i and 0 otherwise. Discuss Nash equilibrium of the game.

7. Consider Rubinstein's infinite horizon bargaining game with different discount factors δ_1 and δ_2 for players 1 and 2. Show that the backwards induction outcome of the game is player 1 immediately offering the settlement $\left(\dfrac{1 - \delta_2}{1 - \delta_1 \delta_2}, \dfrac{\delta_2(1 - \delta_1)}{1 - \delta_1 \delta_2} \right)$ and player 2 accepting it.

8. Consider the three-firm oligopoly where the (inverse) market demand is given by $P(Q) = a - Q$ and $Q = q_1 + q_2 + q_3$. Each firm has a constant marginal cost of production, c, and no fixed cost. The firms choose their outputs in the following sequence: firm 1 chooses $q_1 \geq 0$; firms 2 and 3 observe q_1 and simultaneously choose q_2 and q_3. What is the subgame perfect outcome?