

RAMAKRISHNA MISSION VIDYAMANDIRA
(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. FOURTH SEMESTER EXAMINATION, MAY 2025
SECOND YEAR [BATCH 2023-27]

Date : 08/05/2025

Time : 11 am – 1 pm

ECONOMICS

Paper : 4ECOMJC3

Full Marks : 50

1. Answer **any six** of the following questions: [6×5]
- a. A monopolist can produce at constant average and marginal cost of 5. The firm faces a demand curve given by $X= 53-P(X)$.
- i) Calculate the profit maximizing output-price combination for the monopolist. Also calculate the monopolist's profit.
- ii) What output level would be produced by this industry under perfect competition?
- iii) Calculate the producer's surplus under monopoly and perfect competition. (3+1+1)
- b. Explain the pay-off matrix of Rock-Scissor-Paper game. Comment on the solution of this game. (4+1)
- c. Consider a monopolistically competitive firm whose total cost is- $TC= Q^3-30Q^2+301Q$. Suppose its demand function $P=157-6Q$ and MR function is $MR=157-12Q$.
- i) How much does the firm produce?
- ii) How much does the firm charge price?
- iii) How large are the firm's profits?
- iv) If all firms in the industry are identical to this firm, is the industry in equilibrium? [2+1+1+1]
- d. Let the demand function be $p = 20- 0.5q$ & the total cost function is $C= 0.04 q^3 - 1.94 q^2 + 32. Q +96$. Determine maximum profit and corresponding price and quantity for a monopolist.
- e. Determine the maximum profit and the corresponding price and quantity for a perfectly discriminating monopolist whose demand and cost functions are
- $P= 2200 -60q$
- And
- $C= 0.5Q^3 - 61.5q^2 + 2740 q$ respectively.
- f. True or false: Long run industry supply curve for the decreasing cost industry is an upward sloping straight line.
- g. Find out the Nash equilibrium of the following game

Player B

		L	R
Player A	U	10, 5	15, 0
	D	6, 8	20, 2

2. Answer **any two** of the following questions:

[2×10]

- a. i) Two firms compete in selling identical widgets. They choose their output levels Q_1 and Q_2 simultaneously and face the demand curve - $P = 30 - Q$ where $Q = Q_1 + Q_2$. Until recently, both firms had *zero marginal costs*. Recent environmental regulations have increased Firm 2's marginal cost to \$15. Firm 1's marginal cost remains constant at zero. True or false: As a result, the market price will rise to the *monopoly* level.
- ii) Two firms compete by choosing price. Their demand functions are $Q_1 = 20 - P_1 + P_2$ and $Q_2 = 20 + P_1 - P_2$ where P_1 and P_2 are the prices charged by each firm, respectively, and Q_1 and Q_2 are the resulting demands. Note that the demand for each good depends only on the difference in prices; if the two firms colluded and set the same price, they could make that price as high as they wanted, and earn infinite profits. Marginal costs are zero. Suppose Firm 1 sets its price *first* and then Firm 2 sets its price. What price will each firm charge, how much will it sell, and what will its profit be? [5+5]
- b. Suppose the airline industry consisted of only two firms: Indian Airlines and Spice Jet. Let the two firms have identical cost functions, $C(q) = 40q$. Assume the demand curve for the industry is given by $P = 100 - Q$ and that each firm expects the other to behave as a Cournot competitor.
- i) Calculate the Cournot-Nash equilibrium for each firm, assuming that each chooses the output level that maximizes its profits when taking its rival's output as given. What are the profits of each firm?
- ii) What would be the equilibrium quantity if Spice Jet had constant marginal and average costs of Rs25000 and Indian Airlines had constant marginal and average costs of Rs40000? [5+5]
- c. i) Explain the establishment of shops from Belur Math to Grand Trunk Road with the help of an oligopoly model.
- ii) A competitive firm finds that at equilibrium level of output its $AR = 20$, $MC = 20$ and $AC = 60$ while $AVC = 16$. Will the firm produce or shut down? At what level of price will it shut down? [5+5]

_____ × _____