RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

B.A./B.Sc. THIRD SEMESTER EXAMINATION, DECEMBER 2014

SECOND YEAR

Date : 17/12/2014 **ECONOMICS (Honours)**

Time : 11 am – 3 pm **Paper :** III Full Marks : 100

[Use a separate Answer Book for each group]

Group – A

(*Answer **any three** questions from **Q.No 1- 6***) [3×6]

1. During recent years, Micro Chips Corp. has enjoyed substantial economic profits derived from patents covering a wide range of inventions and innovations for microprocessors used in high-performance desktop computers. A recent introduction, the Penultimate, has proved especially profitable. Market demand function for the product is as follows :

   P = \$5,500 – \$0·005Q

   (Fixed costs are nil because research and development expenses have been fully amortized during previous periods. Average variable costs are constant at \$4,500 per unit)

   a) Calculate the profit-maximizing price/output combination and economic profits if Micro Chips enjoys an effective monopoly because of patent protection. [3]

   b) Calculate the price/output combination and total economic profits that would result if competitors offer clones that make the market perfectly competitive. [3]

2. Suppose there are 100 identical firms in the perfectly competitive notecard industry. Each firm has a short run total cost curve of the form :

   $$STC = \frac{1}{300}q^3 + 0\cdot 2q^2 + 4q + 4$$

   a) Calculate the firm's short-run supply curve with q (the number of crates of notecards) as a function of market price (P). [1]

   b) Calculate the industry supply curve for the 100 firms in this industry. [1]

   c) Suppose market demand is given Q = –200P + 8,000. What will be the short-run equilibrium price quantity combination? [2]

   d) Suppose everyone starts writing more research papers and the new market demand is given by Q = –200P + 10,000. What is the new short-run price-quantity equilibrium? How much profit does each firm make? [2]

3. Consider a perfectly competitive market with firms having identical cost functions. The long run total cost function for each firm is given by :

   $$C = q^3 - 4q^2 + 8q$$

   where q stands for firm's output. There is free entry and exit of firms in long run.

   Suppose, the market demand function is given by : D = 2000 – 100P

   a) Determine equilibrium price, aggregate quantity and number of firms in long run equilibrium. [3]

   b) Now suppose that all firms merge and the market converts into monopoly. Find out equilibrium price, output and level of profit at equilibrium. [3]

4. Suppose a supplier can identify two distinct groups of customers, students and non-students. The demand by students 'q_s' and the demand by non-students, q_n are given by,

   $q_s = 100 - 8p_s$ and $q_n = 100 - 4p_n$, respectively. The total demand, $q_t = q_s + q_t$; $q_t = 200 - 12p_t$. The supplier cost of Rs 2 per unit is constant regardless of the number of units supplied.

   a) What price maximizes profits if the firm charges everyone the same price? [1]

   b) Show the firm can secure greater profits by charging different prices for the two groups than it can by charging everyone the same price. [2]

c) The demand and total cost functions faced by a monopolist are given by : $P = 120 - Q$ and $C = Q^2$, respectively. Find out the level of output and profits if the monopolist practices perfect price discrimination. Compare your results with that under profit maximization. [3]

5. Consider the following model of duopoly with differentiated products, where two firms simultaneously set prices. There are no fixed costs, but they face marginal costs of C_1 and C_2 respectively, where $C_1 > C_2$. Demand functions for the two firms, where $0 < \alpha < 1$, are : $q_1 = 1 - p_1 + \alpha p_2$, $q_2 = 1 - p_2 + \alpha p_1$

   a) Derive and illustrate the reaction functions for the two firms. [4]

   b) Solve for equilibrium prices and quantities. [2]

6. Let firm i's payoffs are profits, $\pi_i(q_i, q_j) = aq_i - bq_i^2 - bq_iq_j - cq_i$, i = 1, 2. Find the Cournot-Nash equilibrium and also show that it is Pareto suboptimal. [4+2]

(*Answer **any four** questions from **Q.No 7-12***) [4×8]

7. The demand curve faced by a monopolist is given by $P = 100Q^{-1}$. The total cost function is given by $C = 5Q$.

   a) What can you say about the level of output if the monopolist attempts to maximize profits? Explain you answer clearly. Draw the profit function of the monopolist? [5]

   b) What do you mean by monopoly power and how can it be measured? [3]

8. a) What are the "monopoly" and "competitive" features of monopolistic competition? [4]

   b) Can the short-run supply curve of a monopolistically competitive firm be derived? Why? [4]

9. a) Can a perfectly competitive firm ever maximize profit by operating on the downward sloping portion of its MC curve? Why? [4]

   b) "In a constant cost industry, while the long run equilibrium output of the industry is determinate, equilibrium output of a firm and, hence, number of firms in long run equilibrium are indeterminate". Examine the validity of the statement. [4]

10. Suppose that an amusement park owner can practice first-degree price discrimination by charging a different price for each ride. Assume that all rides have zero marginal cost and all consumers have same tastes. Will the monopolist do better charging for rides and setting a zero price for admission, or better charging for admission and setting a zero price for rides? Explain. [8]

11. Determine Bertrand duopoly equilibrium where both the firms have identical and constant marginal cost. What is Bertrand's paradox? [8]

12. Discuss a suitable model to explain rigidity of prices in an oligopoly market. [8]

Group – B

(*Answer **any three** questions from **Q.No 13-17***) [3×4]

13. Explain why, in the long run, an increase in Government spending leads to full crowding out of private investment. [4]

14. Explain the concept of Solow Residual. [4]

15. Show that the Phillips curve is nothing but an alternative expression of the short run aggregate supply curve. [4]

16. Define sacrifice ratio. What will be value of such ratio if people have —

   i) Adaptive Expectations

   ii) Rational Expectations. [2+ (1+1)]

17. Explain why the portfolio theory of money demand fails to explain money holding when we adopt to a narrow measure of positive money demand. [4]

(*Answer either* ***Q.No 18 or 19***) [1×8]

18. Consider the production function $Y=K^{0.3} L^{0.7}$. Find out the optimal capital output ratio as a function of the savings rate, depreciation rate and employment growth rate. Suppose there occurs an increase in the savings rate, show graphically how will it impact the equilibrium capital stock and capital output ratio. [4+4]

19. How would the following affect money supply of an economy :
    i) Why might a banking crisis lead to a fall in the money supply? [2]
    ii) The Central Bank sells Government bonds to the public. [2]
    iii) Introduction of automatic teller machines in banks that makes deposits more convenient. [2]
    iv) Large and exogenous capital inflow in a country like India where exchange rate is not fully flexible. [2]

(*Answer* ***any two*** *questions from* ***Q.No 20-23***) [1×15]

20. Explain the different concepts related to neutral technological progress. Which of them is used in the Solorian growth model? How does it explain the persistent rise in per capita income of an economy. [6+1+8]

21. i) What is called a sterilisation of capital flow by the central banks? [4]
    ii) Explain the process of money creation and derive the money multiplier assuming cash observe ratio of the central bank M and cash holding ratio of public by h. (Cash/Deposits = h) [4]
    iii) How does the cost of holding money reformulates the money demand function as represented by the quantity theory? [4]
    iv) In what ways does the existence of near money complicate the conduct of monetary policy? [3]

22. i) Under what circumstances might it be possible to reduce inflation without causing a recession? [4]
    ii) Explain two ways in which a recession might raise the natural rate of unemployment. [4]
    iii) Why does the Phillips curve become vertical in the long run? [3]
    iv) Explain the factors which determine the natural rate of unemployment. What kind of unemployment does the natural rate capture. [2+2]

23. Prove each of the following statements about the steady state of the Solow model with population growth and technological progress.
    i) The Capital-output ratio is constant. [3]
    ii) Capital and labour each earn a constant share of an economy's income. [4]
    iii) Total capital income and total labour income both grow at the rate of population growth plus the rate of technological progress. [4]
    iv) The real rental price of capital is constant, and the real wage grows at the rate of technological progress. [4]

——— × ———