RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

B.A./B.Sc. SECOND SEMESTER EXAMINATION, MAY 2014

FIRST YEAR

Date : 23/05/2014 **Economics (Honours)**

Time : 11 am to 3 pm Paper : II Full Marks : 100

[Use a separate answer book for each group]

Group-A

Answer **any three** questions: 3x4=12

1. (a) Prove that in a two-commodity framework, the commodities are necessarily net substitutes. 4

   (b) My utility function $U(x_1,x_2)$ satisfies the hypothesis of strictly diminishing marginal rate of substitution, both goods are economic goods for me, and I am currently at the bundle $(x_1,x_2)=(50,50)$ where $MRS(50,50)=2$. Can you say whether or not I would be willing to:
   (i) Give up 20 units of x_1 in exchange for receiving 20 units of x_2?
   (ii) Give up 20 units of x_2 in exchange for receiving 20 units of x_1? Explain your answer. 4

   (c) Suppose at prices (1,1) the consumer buys (5,15). If price changes to (2,1), calculate the value of the compensation required to keep his real purchasing power unchanged. Now his consumption becomes (6,8). Is his behaviour consistent with weak axiom of Revealed Preference (WARP)? Explain. 2+2

   (d) Consider a production process which uses two inputs X_1 and X_2 to produce an output Y. The output elasticity of the factors are constant and they add upto 1. The output elasticity of X_1 given to be $\alpha(>0)$. Further, this production process uses both the inputs, and the usage of inputs are weighted by the respective output elasticities. Construct the production function and provide a distinct explanation of the technology in use as far as the production set is concerned. 4

   (e) Construct the average and marginal products of labour associated with the production function $q=\min\left(\frac{L}{5},\frac{K}{4}\right)$. 2+2

   (f) A two-factor production function has infinite elasticity of substitution. How will the expansion path look like? Can you explain the shapes of LAC and LMC curves? 2+1+1

2. Answer **any one** question: 1×8

   (a) (i) Prove that profit function is a convex continuous function, homogeneous of degree one. 4
   (ii) State and Prove the Hotelling's Lemma. Show that Hotelling's Lemma is synonymous to the convexity of the profit function. 4

   (b) Draw the indifference map associated with the utility function $U = \log x + y$.
   (i) How do the income-consumption curve and the Engel curve for good x look like? 4
   (ii) How can price effect be decomposed into substitution effect and income effect of price change in this case? 4

3. Answer **any two** questions: 2×15

   (a) Ramu consumes only apples and bananas. His income is Rs. 12, the price of apples is Rs. 2 per kilo and the price of bananas is Rs. 1 per kilo.
   (i) Draw Ramu's budget line in a graph where the quantity of apples is on the horizontal axis and the quantity of bananas is on the vertical axis.
   (ii) Suppose Ramu likes to consume 2 kilos of bananas with each kilo of apples. Show on the graph which bundle he would choose and explain why.
   (iii) Suppose that the government decides to subsidize apple producers, so that the price of apples to consumers falls to Rs. 1 per kilo. Repeat your answers to parts (i) and (ii).

(iv) Instead of a subsidy, the government decides to provide Ramu with a subsidy which he can use only for buying apples. Calculate the value of the subsidy to keep Ramu as well off as in (iii). 3+4+4+4

(b) A consumer has the utility function U = x_1x_1. His income is Rs. 120 and the prices of goods 1 and 2 are Rs. 2 and Rs. 3 respectively.

(i) Show his utility maximizing choice in a graph. 4

(ii) Suppose price of good 1 increases by 44% with no change in price of good 2. By how much would his income have to increase for enabling him to maintain his original utility level? 4

(iii) Identify the price effect, substitution effect and income effect for good 1. 5

(iv) Draw price consumption curve and income consumption curve for this case. 2

(c) (i) Suppose a firm faces a wage rate of 10 and a capital rental rate of 4. In the following two situations, how much of each input should this firm hire in order to minimise the cost of production of 100 units? What are the firm's total cost? How would the total cost change if capital rental rises to 10.

(a) The firm produces with a fixed-proportions production function that requires 0.1 labour hours and 0.2 machine hours for each unit of output.

(b) The firm's production function is given by Q = 10L+5K. 5

(ii) A firm producing a hockey stick has a production function given by $q = 2\sqrt{KL}$. In the short-run, the firm's amount of capital equipment is fixed at *K*=100. The rental rate for *K* is v = Rs. 1 and the wage rate is *w* = Rs. 24. Calculate the firm's short-run total cost function. Calculate the short-run average cost function. 5

(iii) Consider the following cost function :

$C = \alpha + \beta q + \delta q^2 + \lambda q^3$; Under what parametric restrictions will this cost function generate U-shaped AVC and MC curves? 5

(d) (i) "Long run marginal cost includes the cost of capital (which is variable in the long run) while the short run marginal cost does not (capital if fixed in the short run). Thus LMC must be greater than SMC." — Do you agree? Explain. 6

(ii) The long run cost function for each firm that supplies some good is $c = x^3 - 4x^2 + 8x$. Describe the industry's long run supply function. If the market demand function for the good is X = 2000 – 100 P, determine the number of firm in long run equilibrium. 5+4

Group-B

4. Answer **any three** questions: 3x4

(a) Distinguish between Real and Nominal GDP.

(b) What is frictional unemployment?

(c) In an economy investment exceeds saving by Rs. 10,000. Budget deficit is Rs. 6,000 and net exports is Rs. 4,000. What, if any, is wrong with the given data?

(d) How does the imperfect information model explain the shape of the AS curve?

(e) What is meant by "consumption puzzle"?

(f) Define Tobin's *q*.

5. Answer **any one** question: 1×8

(a) Consider a closed economy without government described by the following equations.

C = 25 + 0.7Y

I = 5 + 0.2Y

(i) Obtain the equilibrium values of output and saving. 2

(ii) Suppose that autonomous consumption falls to 20 due to an increase in saving propensity. What happens to equilibrium level of saving? Is the result surprising? Explain using a diagram. 2+4

(b) What is 'Borrowing constraint'? How does the borrowing constraint influence the consumption decision of individuals? 4+4

6. Answer **any two** questions: 2x15

(a) (i) Define natural rate of unemployment. Show that, any policy aimed at lowering the natural rate would either reduce the rate of job separation or increase the rate of job finding. 2+3

(ii) Explain the role of Minimum-Wage Laws and Collective Bargaining in explaining the persistence of employment in an economy. 5+5

(b) (i) How is the equilibrium level of income derived in an IS-LM framework? 7

(ii) Show, using IS-LM framework, whether a fiscal policy of raising taxes will lead to a recession, deep recession or no recession depends on the response of monetary authority to the fiscal policy. 8

(c) How does the life cycle hypothesis resolve the seemingly contradictory pieces of evidence regarding the consumption behaviour. 15

(d) (i) Explain, with the help of model, how the amount of residential investment is determined in an economy. 7

(ii) Examine the impact of an increase in real interest rate on the real cost of capital and business fixed investment. 8

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