COURSE NO: ECON F242   COURSE TITLE: MICROECONOMICS
TIME: Hr.3.00   MARKS: 45   DATE: 07-MAY-2013
_____

NOTE: This paper consists of two Parts: PART-A (Closed Book – 20 Marks) and PART-B (Open Book– 25 Marks). After completing PART-A, attempt PART-B (Open Book) in a separate answer sheet provided to you. Answer to the point. Write legible.
_____

PART-A (CLOSED BOOK)   **20 MARKS**
Instructions: You must show all your work to receive full credit.   Any assumptions you make and intermediate steps should be *clearly* indicated. Do not simply write down a final answer to the problems without an explanation. No partial marking for answers.

1) Three BITSians, Garvit, Chandra and Greg are trying to decide where to go to dinner one night. There are three choices: Haldirams, Subway and Tigher Bell. Garvit says his ranking of the three, from best to worst is: Haldiramas, Subway and then Tigher Bell. Greg's preferences are: Subway, Tigher Bell, and then Haldirams. Chandra's preferences are: Tigher Bell, Haldirams and then Subway.

   Garvit proposes they take each pair of alternatives and let a majority vote determine the friend's family preference ranking over each pair of alternatives. That is to say if "A" goes up against "B", the alternative with more votes is preferred to the other. Determine the friend's family ranking over each pair of alternatives based on Garvit's proposal. Over the three alternative eateries, is this family's ranking **complete**? Is this family's ranking **transitive**?

                                                                                                                    (1.0)

2) Which   of   the   following   utility   functions   represent   *the   same*   underlying   preferences?

$u = 2x + 3y$	$z = 10 + 2\ln(x) + 3\ln(y)$
$v = e^{(2x + 3y)}$	$g = 23 + 4x + 6y$
$w = x^2 + y^3$	$h = -23 - 2x - 3y$

                                                                                                                    (1.0)

3) Get the income-expansion path for the utility function $U = X^2Y^3$. Assume that prices $P_X = 1 \; and \; P_Y = 2$ and Use incomes of Rs.10, Rs.20, and Rs.40 to get the points on it. Label all axes. Also, If Y is plotted on the Y Axix, what is the slope of the Engel curve for Y?

                                                                                                                    (2.0)

4) Indigo Airlines is celebrating their new merger with a frequent-flyer program. Tickets normally cost Rs.1 per mile, but after the first 5000 miles, the price is Rs.0.50 per mile. Sam has Rs.10,000 to spend on air travel and white socks (always Rs.1 per pair). Sam's preferences over combinations of socks and air-miles are represented by:
$U(X_{air}, X_{socks}) = X_{air} X_{socks}$, where Xair is air travel in miles and Xsocks is white socks measured in pairs.
What would Sam's demand for air travel have been without the frequent flyer program? What is Sam's demand for air travel under the frequent flyer program?

                                                                                                                    (2.0)

5) Gagan is a stamp (X_1) collector, but he also likes fancy clothes (X_2). His utility function is given by:
$U(X_1, X_2) = X_1 + 10X_2 - (1/2) X_2^2$. Each stamp costs $P_1 = 1$ and a piece of his favorite clothing costs $P_2 = 2$.
a) Assuming that his total income is given by m=Rs.10, and his optimal choice of X_1 and X_2.(Is it interior?)
b) Suppose next year Gagan's salary doubles, resulting in his higher income m=Rs.20. Find his new demanded quantities of stamps and clothes. In point a) and b) what is the marginal utility from one rupee invested in stamps, and in clothing (at the optimal demand). Are they equal?

                                                                                                                    (2.0)

6) Anand's wealth is Rs.100 and he is an expected utility maximize with a von Neumann-Morgenstern utility function: $U(W) = W^{1/2}$ Anand is afraid of oversleeping his economics exam. He figures there is only a 1 in 10 chance that he will, but if he does, it will cost him Rs.100 in fees to the University for taking an exam late. Anand's neighbor, Madan, never oversleeps. he offers to wake him one hour before the test, but he must pay her for this service. **What is the most that Anand would be willing to pay for this wake-up service? Let x be the maximum price Anand is willing to pay Madan for wake-up service. Calculate x**.

(2.0)

7) A firm uses two inputs to produce one commodity. Its production function is: $f(X_1, X_2) = \{min \{X_1, 2X_2\}\}$. Draw the isoquants for producing 4 and 5 units of output respectively. Does this production exhibit increasing, decreasing or constant returns to scale? If the input prices are (1, 1), derive the cost function as a function of Y, the output level. If the input prices are (w_1, w_2), what is the cost function $C(w_1.w_2, Y)$?

(2.0)

8) A firm's production function is given by $f(Z_1, Z_2) = (Z_1^\rho + Z_2^\rho)^{(A/\rho)}$ where $\rho < 1$, $\rho \neq 0$ and $A > 0$. Derive the conditional demands and also the supply function

(2.0)

9) Suppose the total cost function for a firm is given by: $C = q(v + 2\sqrt{(vw)} + w)$. Use the Sheppard's lemma to compute the constant output demand functions for each input, capital k and labor l. Use the same results to compute the underlying production for q.

(2.0)

10) Consider a perfectly competitive market and a firm with a $TC = 50 + Q^2$ and a price of 10. How much revenue/loss is this firm making? What will price have to be so that there is zero economic profit?

(2.0)

11) Assume that there are 1000 identical firms producing diamonds. Let the total cost function for each firm be given by: $C(q.w) = q^2 + wq$. Where q is the firm's output level and w is the wage rate of diamond cutters. If w = 10, what will be the firm's short run supply curve? What is the industry's supply curve? How many diamonds will be produced at a price of 20 each? How many more diamonds would be produced at a price of 21?

(2.0)

***** **Attempt PART-B (Open Book)** *****

ECON F242: MICROECONOMICS   **DATE: 07 MAY 2013**
MAX.MARKS: 25

COMPREHENSIVE EXAMINATION – PART: B (OPEN BOOK)

Note: Attempt all questions. Start answering each question on a fresh page. Attempt all parts of question at one place. You must show all your work to receive full credit.   Any assumptions you make and intermediate steps should be clearly indicated. Do not simply write down a final answer to the problems without an explanation. Read the questions carefully, answering what is asked.

B1. Consumers may consume either alcohol or composite consumption item "F". The price of a unit of alcohol is initially Rs.1.00 as is the price of a unit of "F". Consumers have income of I=Rs.100.00 to spend on the two consumption items. Additionally, there are two types of consumers – one type is represented by Bandan and the other type is represented by Siddaarth. When maximizing utility, consumers like Bandan initially consume 25 units of alcohol, while consumers like Siddaarth consume 75 units of alcohol.

   a) Depict the above information using an indifference map with alcohol measured on the horizontal axis. Label the budget constraint BC_1 and state what its slope is. Also, add an indifference curve labeled U_B for Bandan representing her optimal level of utility when she maximizes utility. Do the same for Siddaarth, labeling his indifference curve U_S. Indicate Bandan and Siddaarth's utility maximizing consumption bundles at current prices with a "b" and "s" respectively.

   Alcohol abuse can cause motor vehicle accidents and liver cirrhosis. Additionally motor vehicle accident mortality is the leading cause of deaths for people under the age of 35, and alcohol is involved in over ½ of these crashes. Consider the following two plans whose goal is to reduce alcohol consumption.

   Plan A: Reduce alcohol consumption by doubling the price of alcohol from Rs.1.00 to Rs.2.00 a unit.

   Plan B: Enact a law that prohibits each consumer from purchasing more than 50 units of alcohol.

   b) Graph the budget constraint that would result from plan A. Label that new budget constraint BC_A. Then, do the same for plan B, labeling the budget constraint that results from plan B BC_B.
   c) Critically examine the two proposals. Which of the two plans better achieves the goal of reducing alcohol consumption? Support your argument using the microeconomic concepts we have studied. A cogent answer will explain intuitively how the substitution and income effects resulting from each plan support your argument.
   d) What *Marginal Rate of Substitution (MRS) between "F" and alcohol*. What is Bandan's and Siddaarth's MRS?

                                                                                                          (6.0)

B2. Assume throughout the problem that a person's preferences are monotone. Given are two price-income combinations $(X^0, P_1^0, P_2^0) = (1, 1, 1)$ and $(X^1, P_1^1, P_2^1) = (1, 1/2, 2)$

   a) Use both budget sets in a two-good diagram and Can you tell just from this information whether the individual is worse off or better off with (X^1, P_1^1, P_2^1) compared to (X^0, P_1^0, P_2^0)? Explain briefly.
   b) Suppose that you don't have any information about what the consumer chose under $(X^0, P_1^0, P_2^0) = (1, 1, 1)$ and But you are told that the consumer's preferences are homothetic and strictly convex, and that she chooses consumption bundle (4/3; 1/6) under the new price-income combination $(X^1, P_1^1, P_2^1) = (1, 1/2, 2)$. What do you know about the consumer's optimal consumption bundle under the old price-income combination $(X^0, P_1^0, P_2^0) = (1, 1, 1)$? Explain briefly.
   c) Suppose you are told that in addition to b) the consumer has Cobb-Douglas preferences such that her utility function is given by; $U(q_1, q_2) = (q_1^\alpha q_2^{1-\alpha})$. Given this information in combination with the info in b), which is the bundle chosen by the consumer at $(X^0, P_1^0, P_2^0) = (1, 1, 1)$?
   d) What is the consumer's indirect utility function?

                                                                                                          (6.0)

B3. Vasan owns a factory on the banks of a river that occasionally floods. He has no other assets. If there is no flood this spring, Vasan's factory will be worth Rs.500, 000. If there is a flood, the factory will be worthless. Vasan is an expected utility maximizer with von Neumann Morgenstern utility function $U(w) = lnw$ where w is his wealth. Vasan believes that the probability of a flood is 1/10. Vasan is offered a chance to buy as much flood insurance as he likes at a cost of Rs.C per rupee's worth of insurance. The way this policy works is that if he buys Rs.X worth of flood insurance and if there is no flood, he must pay a total of Rs.CX in insurance premiums. If there is a flood, he doesn't have to pay his insurance premium, and he receives a payment of Rs.X from the insurance company.

   a) Write down Vasan's budget constraint for the contingent commodities "wealth if no flood" and "wealth if flood".

   b) At what price C will Vasan buy just enough insurance so that his wealth is the same, whether or not there is a flood?

   c) Write down a formula for the amount of insurance that Vasan will buy as a function of the cost Rs.C per rupee of insurance. What is the price elasticity of Vasan's demand for insurance?

(5.0)

B4. Suppose all firms in an industry have the following long-run total cost curve: $c(y) = 0.5y^2 + 20y$. Derive the relevant cost curves. Suppose the number of (identical) firms is **n**. Let $Y = ny$ denote the aggregate industry supply. Derive an expression for the aggregate supply as a function of the market price P and n; i.e., Y as a function of P and n.

Suppose the market demand curve has the equation $Y = 30 - P$. Use your answer above to compute the equilibrium price in the industry when the number of firms is n, i.e., write an expression for the equilibrium price as a function of n. Does each firm make a positive profit regardless of the value of n? Will there always be a reason for new firms to enter this industry? Does the aggregate output converge to some level as n tends to infinity? If so what is this? What is the corresponding equilibrium price and profit of each firm (as n tends to infinity?)

(5.0)

B5. In the steep recession of 1921, union leaders advised coal-mine owners to "sell your coal at a profit or don't sell it at all!" Should a business only sell its output if it can make a profit? Why or why not? Justify your answer with a proper explanation. Full credit requires good and correct reasoning.

(3.0)

****