MASTER OF ARTS (ECONOMICS)

Term-End Examination

December, 2007

MEC-001 : MICROECONOMIC ANALYSIS

Time : 3 hours *Maximum Marks : 100*

Note : *Answer **two** questions from Section A, **four** from Section B and **two** from Section C.*

SECTION A

*Answer any **two** questions from this section.* 2×20

1. (i) Suppose the principal signs a contract in a moral hazard situation. Do agents have an incentive to work as hard as the principal would like if the payment is planned to be made on the basis of performance ? Give reasons to support your answer.

(ii) Firm-A produces a final good using an input provided by Firm-B. The input could be either of low (L) or high (H) quality. The potential revenues of Firm-A are affected by the type of input used so that sales revenues are X_L and X_H (with $0 < X_L < X_H$). The final good's quality and thus sales revenues depend on the input quality denoted by q, and on a random variable about which both the firms have the same prior belief. The input's quality q chosen by Firm-B is its private information. Hence Firm-A cannot observe q. It has the following beliefs :

For any given quality of the input q,

$Prob(X = X_L \mid q) \equiv p_L(q)$, $Prob(X = X_H \mid q) = p_H(q)$, with $p_L(q) + p_H(q) = 1$.

Firm-A receives revenue X and pays a wholesale price w to Firm-B for the input and it is risk neutral. Firm-B has a total utility function

$U(w, q) = u(w) - Cq$

where u(w) = utility from the wholesale price and Cq = total cost. Its reservation utility = 0. If $u' > 0$, $u'' < 0$ and the Firm-B can choose between two qualities, $\underline{q}$ and $\bar{q}$ with $0 < \underline{q} < \bar{q}$,

(a) What would be the first-best optimum if input quality were verifiable ?

(b) What optimal contract can Firm-A design to obtain a high-quality input under asymmetric information ?

2. (i) Discuss Walras' law.

(ii) There are two consumers A and B consuming two goods (1 and 2). Their utility functions and endowments (w_i) are given as follows :

$$U_A\left(x_A^1, x_A^2\right) = \log x_A^1 + (1 - a) \log x_A^2, \; w = (0, 1)$$

and

$$U_B\left(x_B^1, x_B^2\right) = b \log \left(x_A^1\right) + (1 - b) \log x_B^2, \; w = (1, 0)$$

Find the prices at which market clears and the equilibrium allocation of goods.

3. (i) How would you explain the Cournot equilibrium ? On what ground would you argue that Stackelberg equilibrium captures the firm's behaviour better than Cournot's ?

(ii) There is an industry with two firms. Each firm has constant marginal cost. Let the inverse market demand function be $P(Q) = 100 - Q$ where $Q = q_1 + q_2$, the sum of output produced by firms one and two.

(a) Find each firm's output in the Cournot equilibrium.

(b) If Firm-1 acts as a leader and Firm-2 as a follower, what is each firm's output in the Stackelberg equilibrium ?

4. How would you explain the central idea behind Pareto efficiency ? What shortcomings will such an idea have as a rule for making social decision ? What other options would you like to offer for social decision making ? Discuss their main features.

SECTION B

*Answer any **four** questions from this section.* 4×10

5. Two boys, Dravid and Viru, are driving from opposite directions on a road which has only one lane. Each has two strategies to show up his upmanship (pride) : change the direction to go out of the road or stay on the road. If one chooses to change the direction, he loses face. However, if both choose to continue driving, they are both killed because of collision. The pay-off matrix for this game is given as

		Player B	
		Continue	Turn
Player A	Continue	– 3, – 3	2, 0
	Turn	0, 2	1, 1

Find all pure and mixed strategies equilibria of the game. Also what is the probability that both will survive ?

6. Let $U = x^{1/3} y^{2/3}$ be the utility function where x and y are two goods. Denote p_x and p_y as respective prices of the goods x and y. If M is given as the income of the consumer,

(i) derive the indirect utility function $V(p_x, p_y, M)$

(ii) derive the expenditure function $E(p_x, p_y, U)$.

7. Suppose that the utility function of a consumer is given as $U(x_1, x_2) = x_1^{1/2} x_2^{1/2}$ where x_1 and x_2 are the consumption in two periods. This consumer lives for two periods only. In period 1, her income is Rs. 5000 whereas she earns nothing in period 2. The market rate of interest is given as 20%. Find the optimum consumption in each period.

8. Why would you justify the existence of limit-price among firms ? With the help of Bain's limit pricing model, justify your answer.

9. Describe Arrow's impossibility theorem. Do you agree with this result ? Give reason in support of your answer.

10. An individual with initial wealth of Rs. 400 has a 20% chance of getting into an accident. If the accident occurs, he will lose Rs. 300 leaving him with Rs. 100. The individual maximises his VNM utility function which is given as $u(w) = \sqrt{w}$ where w = wealth. Find his expected utility and the certainty equivalent wealth.

SECTION C

*Answer any **two** questions from this section.* 2×10

11. Write short notes on :

(i) Expansion path

(ii) Repeated game

12. (i) Suppose that the demand curve for a good is given by $q_D = 40 - 4p$ where q and p are quantity demanded and price. If price = 5, what is the consumer surplus ?

(ii) What is the present value of Rs. 100 one year from now if interest rate is 10% ? What will be the change in present value if the rate of interest comes down to 5% ?

13. Differentiate between :

(i) Monopoly price and Perfectly competitive market price

(ii) Substitution effect and Income effect