

**M.A. Examination, 2016**  
**Semester-I**  
**Economics**  
**Course-I**  
**( Microeconomics-I )**

**Time: 3 Hours**

**Full Marks: 40**

*Questions are of value as indicated in the margin*

Answer *any four* questions

1. a) Show that a preference relation can be represented by a utility function only if it is rational.  
b) Explain under what condition a choice structure satisfies the weak axiom of revealed preference.  
c) State and prove Roy's identity. 2+3+5
2. a) Consider the utility function  
$$u = 2x_1^{1/2} + 4x_2^{1/2}$$

Where  $x_1$  and  $x_2$  are the two goods.  
Find the demand functions of  $x_1$  and  $x_2$  as they depend on prices,  $P_1$  and  $P_2$  and wealth  $w_1$  respectively.

b) State the properties of the expenditure function. 5+5
3. a) State and prove the Slutsky equation.  
b) Compare between Hicksian notion and Slutsky notion of compensation. 5+5
4. a) State and prove Hotelling's lemma.  
b) Explain the following concepts in production theory:
  - i) No free lunch
  - ii) Irreversibility 5+5
5. a) Mention the properties of the cost function. In this context explain what you understand by Shephard's lemma. 5+5  
b) Given the production function of a firm as  $f(Z_1, Z_2) = Z_1^\alpha Z_2^\beta$ , and  $0 < \alpha, \beta < 1$   
where  $Z_1$  and  $Z_2$  are two inputs and  $W_1$  and  $W_2$  (say) are the unit prices of  $Z_1$  and  $Z_2$  respectively.  
Derive the cost function of the firm.
6. a) Give the conditions under which an allocation is said to be competitive.  
b) Consider a market with demand function  $x(p) = A - Bp$  in which every potential firm has cost function  $c(q) = k + \alpha q + \beta q^2$  where  $\alpha = 0$  and  $\beta > 0$ . Calculate the long run competitive price, output per firm, aggregate output and number of firms. 5+5

P.T.O.

(2)

7. a) Define a Walrasian Competitive General Equilibrium for a Pure Exchange Economy and prove the Walras Law in the context of such an economy.  
b) Consider two consumers with identical utility functions.

$$U^i = U^i(x_i, y_i) = x_i^{1/3} y_i^{2/3}$$

and endowments  $W_1=(1,27)$  and  $W_2=(8,8)$ . Find the Walrasian equilibrium prices and competitive equilibrium allocations. 5+5

8. a) Define a Pareto Optimum and show that when markets function properly, a Walrasian Competitive Equilibrium (WCE) is a Pareto Optimum (PO).  
b) Show that when there are externalities, a WCE is no longer a PO. Can the government intervene and improve the situation in this case? 5+5

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