M.A. Examination, 2018
Semester-I
Economics
Course – C1 (Core)
(Micro Economics-1)

Time: Three Hours **Full Marks: 40**

Questions are of value as indicated in the margin

Answer ***any four*** questions

1. (a) Show that any choice structure generated by rational preferences necessarily satisfies Weak Axiom of Revealed Preference (WARP). Is it also true that a choice structure satisfying WARP has a consistent rational preference relation?

   (b) Consider the utility function $u = 2x_1^{1/2} + 4x_2^{1/2}$

   Find the demand functions for goods 1 and 2 as they depend on prices P_1 and P_2 and wealth, w respectively.

   (c) Show that a preference relation can be represented by a utility function only if it is rational. 3+5+2=10

2. (a) State and prove Roy's identity.

   (b) A consumer in a two-good economy has a demand function x (p, w) that satisfies Walras' law. His demand function for the first good is $x_1(p, w) = {}^{\alpha w}/_{p_1}$. Derive his demand function for the second good. Is his demand function homogeneous of degree zero?

   (c) Explain the relation between Expenditure minimization problem (EMP) and Utility Maximization Problem (UMP). 4+3+3=10

3. (a) State and prove the Slutsky equation.

   (b) Compare between Hicksian notion and Slutsky notion of compensation. 5+5=10

4. (a) State the properties of the expenditure function and prove at least one of the properties.

   (b) Suppose the Walrasian Demand function $x(p,w)$ is homogeneous of degree zero and satisfies Walras' law. Demonstrate either algebraically or diagrammatically that $x(p,w)$ satisfies the weak axiom of revealed preference if and only if for any compensated price change from an initial price-wealth pair (p,w) to a new price-wealth pair $(p', w') = (p', p'.x(p,w))$ we have

   $$(p'-p)\,[x(p', w') - x(p,w)] \leq 0$$

   (c) Draw two diagrams to illustrate first a situation where demand satisfies the weak axiom and second a demand that does not satisfy the weak axiom. 5+3+2=10

P.T.O.

5. (a) State and prove Hotelling's lemma.

   (b) Explain the following concepts in production theory:

   (i) No free lunch

   (ii) Irreversibility 5+5=10

6. (a) Mention the properties of the cost function. In this context explain what you understand by Shephard's lemma.

   (b) Given the production function

   $f(z_1 z_2) = z_1^{\alpha} z_2^{\beta}$ $\quad 0 < \alpha, \beta < 1$

   w_1, w_2 are the unit prices of z_1 and z_2 respectively

   Derive the cost function for the firm. 5+5=10

7. (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=10

8. Write short notes on the following: 5+5=10

   (a) Indirect utility function

   (b) Profit function

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