

M.A. Examination, 2018
Semester-I
Economics
Course –I (Core)
(Microeconomics-I)

(For Back Candidates)

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

$$u = 2x_1^{\frac{1}{2}} + 4x_2^{\frac{1}{2}}$$

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

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

P.T.O.

(2)

- (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
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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