M.A. Examination, 2022
Semester-1
Economics
Course: C1
(Microeconomics-1)

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

Questions are of value as indicated in the margin.
Answer ***any of the four*** questions.

1. (a) Compare the choice-based and preference-based approaches. Which approach, in your opinion, is better for understanding human behaviour?

(b) When is a preference relation rational? Show that a preference relation can be represented by a utility function only if it is rational.

(c) A consumer in a three-good economy (goods denoted $by\ x_1, x_2 and x_3$, prices denoted by $p_1, p_2 and\ p_3$) with wealth level w > 0 has demand functions for commodities 1 and 2 given by

$$x_1 = 100 - 5\frac{p_1}{p_3} + \beta\frac{p_2}{p_3} + \partial\frac{w}{p_3}$$

$$x_2 = \alpha + \beta\frac{p_1}{p_3} + \gamma\frac{p_2}{p_3} + \partial\frac{w}{p_3}$$

(i) Find the demand for good 3.

(ii) Are the demand functions $x_1 and x_2$ homogeneous? 3+3+4 =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 $x_1(p, w) = \frac{\alpha w}{p_1}$. Derive his demand function for the second good. Is his demand function homogeneous of degree zero?

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

3 (a) If u (.) is a continuous utility function representing a locally non-satiated preference relation, how would you represent the indirect utility function? In this context, mention the properties of the indirect utility function and prove at least two of the properties.

(b) Suppose that the Walrasian demand function $x\ (p, w)$ is homogeneous of degree zero and satisfies Walras' law. State and prove the condition under which $x\ (p, w)$ satisfies the weak axiom.

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

4.(a) Define a transformation function in a production technology

(b) State the properties of the profit function and prove at least two of the properties.

(c) Draw two diagrams, one where non-increasing returns are satisfied by production and the other where it is not. 3+5+2 = 10

5. (a) Mention the properties of the Expenditure function and prove at least two of the properties.

(b) Explain the following concepts in production theory: -

(i) Non-empty production set

(ii) Free Disposal

(iii) Non-increasing returns to scale 4+6 = 10

6. (a) Explain and prove Hotelling's Lemma

(b) Given the production function

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

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 of commodities is considered 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: -

(a) Hicksian notion of compensation

(b) No Free Lunch 5+5 =10