MASTER OF ARTS EXAMINATION, 2024

(1st Year, 1st Semester)

ECONOMICS

[MICROECONOMICS I]

Time : Two Hours | Full Marks : 30

Answer ***any six*** questions : 6×5=30

1. a) Define the Lexicographic preference ordering.

   b) State the continuity property of any preference relation defined over the consumption set.

   c) Show that Lexicographic preference ordering fails to satisfy the continuity property. 1+1+3

2. Show that if the commodity space X is finite and the preference relation R over X is rational then there always exist an utility function that represent R over X. 5

3. If the Marshallian demand function of commodity i is given by

$$x_i\left(p_1, p_2, p_3, w\right) = \frac{w}{p_i^{\frac{1}{1-\alpha}}\left[\sum_{j=1}^{3}\left(\frac{1}{p_j^{\frac{\alpha}{1-\alpha}}}\right)\right]} \;\forall\; i = 1, 2, 3$$

and $\alpha \in (0,1)$

Find the corresponding utility function. 5

[Turn over

4. Suppose the utility of wealth of individual *i* is $u_i(w)$ for all $i = 1, 2$. Show that individual 2 is more risk averse than individual 1 if and only if $u_2(w) = f(u_1(w))$ with $f' > 0$ and $f'' < 0$. 5

5. State the independence axiom of preference relation defined over the lotteries. Discuss its implication to the indifference map over the lottery space. 5

6. Suppose the initial wealth of an individual is $w_0 \in (0,1)$. The individual can invest the entire amount either in a safe asset or in a risky asset. The rate of return from safe and risky asset are respectively *O* and *R*. The rate of return *R* is a random variable with $E(R) = 0$ and $E(R^2) = \sigma^2$. Consider the following utility of wealth $u(w) = \sqrt{w}$ and $v(w) = e^{\alpha w}$ $\alpha > 0$. Which individual will invest in the risky asset? 2.5+2.5=5

7. Suppose the production set of a single output technology is $Y = \{(q, -l, -k) \mid \phi_1(l) + \phi_2(k) \leq q\}$ with $\phi_i' \geq 0$ and $\phi_i'' \leq 0$ for all $i = 1, 2$. Verify the Hotelling Lemma for profit maximization. 5

8. Suppose the production function of a single output technology is $f(l,k) = Min(l + sk, k + sl)$ for all $s \in (0,1)$.

   a) Find the conditonal input demand functions.

   b) Find the cost function.

   c) Verify the Shapard Lemma. 3+1+1