

COURSE CODE(CREDITS): 23B1WHS631 (3)

MAX. MARKS: 15

COURSE NAME: Engineering Economics

COURSE INSTRUCTORS: Bilal Khan

MAX. TIME: 1 Hour

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

1. Prove that the given choice structure $(Z, C(.))$ satisfies the weak axiom of revealed preference, and also define the revealed preference relation for the same. (CO1) [3]
2. A Consumer's utility function is given by $U=x_1x_2$, where x_1 is the quantity of good 1 that is bought and x_2 is the quantity of good 2 that is bought. The price of good 1 is Rs. 10 while the price of good 2 is Rs. 2. Find the optimal combination of both the goods and the consumer's optimal utility level if income constraint is Rs. 100. (CO1) [3]
3. Define Indifference Curve. Explain diagrammatically how consumer equilibrium is attained through indifference curve approach? (CO1) [3]
4. Solve the following constrained optimization problems using the Lagrange multiplier method and, also check for the second order condition to ensure the maximum of a function: (CO1) [2X3=6]
 - (a) $U=f(x+2xy)$; subject to the constraint $2x+4y=100$
 - (b) $U=f(x^{0.25}y^{0.25})$; subject to the constraint $24=\frac{x}{10}+y$
 - (c) $U=f(Q_1^2Q_2^3)$; subject to the constraint $Q_1+4Q_2=10$