(10)

TYB.Sc Sem-VI 17/04/2023

Time: 3 hours Marks: 100

Note: 1. All questions are compulsory.
2. Figures to right indicate full marks.
3. Use of calculator is permitted.

Q. 1. a. Write a short note on post optimality sensitivity analysis with respect to addition and deletion of a constraint in a L.P.P. (10)

b. Use two-phase simplex method to solve following LP problem. (10)
Minimise $Z=\frac{15}{2}x_1 - 3x_2$
Subject to the constraints
$3x_1 - x_2 - x_3 \geq 3$
$x_1 - x_2 + x_3 \geq 2$
and $x_1, x_2, x_3 \geq 0$

OR

p. Given an optimum simplex table for a maximization type LPP, describe the procedure of checking the effect on feasibility of the current solution if an element of requirement vector is changed from b_k to $\bar{b}_k$ where $\bar{b}_k = b_k + \Delta b_k$. How is the solution modified if the change affects the feasibility of the solution? (10)

q. Use dual simplex method to solve the problem: (10)
Minimise: $Z=3x_1 + x_2$
Subject to the constraints:
$x_1 + x_2 \geq 1$
$2x_1 + 3x_2 \geq 2$
and $x_1, x_2 \geq 0$

Q. 2. a. Find the optimum level to which the stock should be raised at the beginning of each period t (t is fixed and known). If the demand 'r' is a discrete random variable with p.m.f P(r). The per unit costs of overstock & under stock are C_1 & C_2 per unit time. Also demand occurs at a uniform rate. (12)

b. Describe different costs associated with inventory system. (08)

OR

p. In a certain manufacturing situation C_1 is holding per item per unit time, C_3 is the setup cost per production cycle, 'R' is the demand rate. Shortages are not allowed and the production rate is finite. 't' is the interval between the start of successive production cycles. 'q' is the number of items produced per production run. Find an expression for the optimum order quantity and the minimum cost per unit time. (12)

q. Explain the problem of inventory models with price breaks. How would you obtain the EOQ in case of a problem with two price breaks? (08)