FACULTY OF SCIENCE
B.Sc. VI-Semester (CBCS) Examination, May / 2019

Subject : Statistics
Paper – VIII (A) (DSE E-1) : Operation Research

Time : 3 Hours   Max. Marks: 60

PART – A (5 x 3 = 15 Marks)
(Short Answer Type)
Note : Answer any FIVE of the following questions.

1. Scope of or
2. Define general LPP
3. State the fundamental theorem of Duality
4. North West corner Rule
5. Unbalanced Assignment problem and Transportation problem
6. Travelling salesman problem
7. Define Slack variables with an example.
8. What are the basic assumptions in a sequencing problem?

PART – B (3 x 15 = 45 Marks)
(Essay Answer Type)
Note: Answer ALL the questions.

9. (a) Solve the LPP by using simplex method

   Maximize $Z = 2x_1 + 4x_2 + x_3 + x_4$

   Subject to the constraints :

   $x_1 + 3x_2 + x_4 \leq 4,$

   $2x_1 + x_2 \leq 3,$

   $x_2 + 4x_3 + x_4 \leq 3,$

   $x_1, x_2, x_3, x_4 \geq 0$

   OR

   (b) (i) Explain the concept of degeneracy in LPP and how to resolve it.

   (ii) Explain the Big-M method of solving an LPP.

10. (a) Define Transportation problem as a special case of LPP. Explain stepping stone method to obtain an optimum solution for a transportation problem.

    OR

    (b) (i) State the fundamental theorem of Duality.

    (ii) Explain the concept of duality and primal dual relationship with an example.

11. (a) Define assignment problem as a special case of LPP and TP. Explain Hungarian method to solve an assignment problem.

    OR

    (b) (i) Determine the Optimal sequence of jobs that minimizes the total elapsed time (T) and also find idle times.

Job	A	B	C	D	E	F	G
M_1	3	8	7	4	9	8	7
M_2	4	3	2	5	1	4	3
M_3	6	7	5	11	5	6	12

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(ii) Explain the process of converting 3 machine 'n' jobs problem into two machine problem.