UG-336 BMS–33/BMC-33

B.Sc. DEGREE EXAMINATION –
JUNE, 2019.

Third Year

Mathematics

LINEAR PROGRAMMING AND OPERATIONS RESEARCH

Time : 3 hours Maximum marks : 75

SECTION A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Explain the Big-M method of solving linear programming problems involving artificial variable.

2. Write the dual of the following problems

Maximize $Z = 3x_1 + 7x_2$

Subject to : $7x_1 + 5x_2 \leq 20$

$3x_1 + 7x_2 \leq 25$

$4x_1 + 7x_2 \leq 30$

$x_1, x_2 \geq 0$

3. Explain the following terms of the transportation problem.

   (a) Basic solution

   (b) Optimal solution.

4. Find the initial solution for the following transportation problem using north-west corner rule.

		Availability			
		A	B	C	
Requirements	1	5	4	3	6
	2	4	7	6	8
	3	2	5	8	12
	4	8	6	7	4
		8	10	12	

5. Solve the game whose pay-off matrix is

		B		
		I	II	III
A	I	–3	–2	6
	II	2	0	2
	III	3	–2	–4

6. Define travelling salesman problem and mention the necessary basic steps to solve it.

7. Mention some of the advantages and disadvantages of having inventory.

8. Explain EOQ problems with price brakes.

SECTION B — (5 × 10 = 50 marks)

Answer any FIVE questions.

9. Explain dual simplex method to solve L.P.P.

10. Use simplex method to solve the following L.P.P.

Maximize $Z = 4x_1 + 7x_2$

Subject to $4x_1 + 3x_2 \leq 12$

$3x_1 + 4x_2 \leq 12$

$x_1, x_2 \geq 0$

11. Find the optimal solution for the assignment problem with the following cost matrix.

	Area			
Salesman	W	X	Y	Z
A	11	17	8	16
B	9	7	12	6
C	13	16	15	12
D	14	10	12	11

12. Solve the following transportation problem.

	A	B	C	Supply
1	10	9	8	8
2	10	7	10	7
3	11	9	7	9
4	12	14	10	4
Demand	10	10	8	

13. Solve the following 2×2 game graphically.

Player B

Player A	B_1	B_2	B_3	B_4
A_1	2	1	0	–2
A_2	1	0	3	2

14. Explain (a) shortage cost (b) caring cost.

15. Explain queue discipline and Kendal's notation for representing queue models.

16. Explain the queueing model (M/M/1):(∞/FCFS).