UG–657 **BMS–33/ BMC–33**

B.Sc. DEGREE EXAMINATION — JUNE, 2018.

Third Year

Mathematics With Computer Application

LINEAR PROGRAMMING AND OPERATIONS RESEARCH

Time : 3 hours Maximum marks : 75

SECTION A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Write basic assumptions in Linear Programming Models.

2. Write the dual of problem

$$Max\ Z = 2x_1 + 3x_2 + x_3$$

subject to $4x_1 + 3x_2 + x_3 = 6$

$x_1 + 2x_2 + 5x_3 = 4$

$x_1, x_2, x_3 \geq 0$

3. Define assignment problem and mention the necessary basic steps to solve it.

4. Find an initial basic feasible solution of the following transportation problem.

	D1	D2	D3	D4	
O1	1	2	1	4	30
O2	3	3	2	1	50
O3	4	2	5	9	20
	20	40	30	10	

5. Solve the game whose pay off matrix is

		I	II	III	B
	I	–3	–2	6	
A	II	2	0	2	
	III	5	–2	4	

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

7. Explain
   (a) Shortage Cost
   (b) Carrying Cost.

8. Explain Queue discipline.

SECTION B — (5 × 10 = 50 marks)

Answer any FIVE questions.

9. Solve the following Linear programming problem by Simplex method.

$$Max\ Z = 5x_1 + 3x_2$$

subject to $3x_1 + 5x_2 \le 15$

$$5x_1 + 2x_2 \le 10$$

$$x_1, x_2 \ge 0.$$

10. Explain the concept of duality.

11. Solve the following transportation problem.

	Destination				
Source	A	B	C	D	Supply
1	6	8	8	5	30
2	5	11	9	7	40
3	8	9	7	13	50
Demand	35	28	35	25	

12. Solve the following assignment problem

	J1	J2	J3	J4
A	10	15	24	30
B	16	20	28	10
C	12	18	30	16
D	9	24	32	18

13. Solve the game by graphical method

$$\begin{array}{ccc} & & \begin{array}{cccc} \mathrm{I} & \mathrm{II} & \mathrm{III} & \mathrm{IV} \end{array} \\ A & \begin{array}{c} \mathrm{I} \\ \mathrm{II} \end{array} & \begin{pmatrix} 1 & 4 & -2 & 3 \\ 2 & 1 & 4 & 5 \end{pmatrix} \end{array}$$

14. Explain basic classification of characteristics of Inventory systems.

15. Explain the queuing model $(M/M/1):(\infty/FCFS)$.

16. Prove that of arrival occur at random in time, the number of arrivals occuring in a fixed time interval follows a poisson distribution.