

**UG-452 BMC-33/BMS-33**

B.Sc. DEGREE EXAMINATION —  
DECEMBER, 2018.

Third Year

Mathematics with Computer Applications

LINEAR PROGRAMMING AND OPERATIONS  
RESEARCH

Time : 3 hours

Maximum marks : 75

SECTION A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Explain Big-M method of solving linear programming problems.
2. Explain slack and surplus variable.
3. Explain North-West corner rule of Transportation problem.
4. Define assignment problem.
5. Explain game theory.

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. Explain nature and significance of Linear Programming problem.
10. Solve the following L.P.P. by simplex method.

$$\text{Max. } z = 5x_1 + 3x_2$$

subject to

$$3x_1 + 5x_2 \leq 15$$

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

$$x_1, x_2 \geq 0$$

11. Solve the following transportation problem

		A	B	C	Availability
Source	1	6	8	4	14
	2	4	9	3	12
	3	1	2	6	5
Required		6	10	15	

12. Describe the Hungarian method of solving assignment problem.

13. Solve the game using graphical method

$$\begin{array}{cc} & \begin{array}{cccc} \text{I} & \text{II} & \text{III} & \text{IV} \end{array} \\ \text{Player A} & \begin{array}{l} \text{I} \left( \begin{array}{cccc} 1 & 4 & -2 & -3 \end{array} \right) \\ \text{II} \left( \begin{array}{cccc} 2 & 1 & 4 & 5 \end{array} \right) \end{array} \end{array}$$

14. Explain the queueing model  $(M/M/1):(\infty:FCFS)$

15. Explain EOQ model – with or without shortages and multi item inventory model with constraints.

16. A T.V. Repairman finds that the time spent on his jobs has an exponential distribution with mean 30 minutes. If he repairs sets in the order in which they come in, and if the arrival of sets is approximately Poisson with an average of 10 per 8 hours day, what is the repairman's expected idle time each day? How many jobs are sent of average set just brought in?

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