

Reg. No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**MBAH 303**

**Third Semester M.B.A. Degree Examination, March/April 2026**  
**BUSINESS ADMINISTRATION**  
**Operations Research**

Time : 3 Hours

Max. Marks : 70

**SECTION – A**Answer **any two** questions. **Each** question carries **ten** marks. **(2×10=20)**

1. Explain the nature and scope of Operations Research. Discuss the role of OR in managerial decision-making with suitable examples.
2. Describe the methodology of Operations Research. Explain the construction, solution and testing of an OR model.
3. Explain the basic concepts of simulation. Describe the steps involved in Monte-Carlo simulation with a simple illustration.

**SECTION – B**Answer **any three** questions. **Each** question carries **twelve** marks. **(3×12=36)**

4. A small furniture manufacturer produces tables (X) and chairs (Y). Each table requires 2 hours of carpentry and 1 hour of finishing, while each chair requires 1 hour of carpentry and 1 hour of finishing. The workshop has 100 hours of carpentry and 80 hours of finishing available per week. The profit on a table is ₹ 40 and on a chair is ₹ 30. Formulate the LPP and solve it using the graphical method to determine the optimal product mix.
5. Find an initial basic feasible solution using the Least Cost Method and optimize the solution.

Origin \ Destination	D1	D2	D3	Supply
O1	6	4	8	120
O2	5	7	6	180
O3	8	6	5	100
Demand	100	150	150	

P.T.O.



6. A company has 4 jobs and 4 machines. The cost of assigning each job to a machine is given below. Determine the optimal assignment that minimizes total cost.

Job \ Machine	M1	M2	M3	M4
J1	9	2	7	8
J2	6	4	3	7
J3	5	8	1	8
J4	7	6	9	4

7. a) Explain the characteristics of a two-person zero-sum game.  
b) Solve the following game using the saddle point method, if it exists :

Player A \ Player B	B1	B2
A1	3	5
A2	4	2

8. The purchase cost of a machine is ₹ 10,000. The annual maintenance cost increases over time as shown below. The resale value is constant at ₹ 2,000.

Year	1	2	3	4	5	6	7	8	9
Maintenance Cost (₹)	1,000	1,400	1,900	2,600	3,400	4,300	5,300	6,400	7,600

Determine the optimal replacement period.

### SECTION – C

Answer should **not** exceed **six** pages.

(1×14=14)

9. The following activities and durations (in days) are involved in a project.

Activity	Time
1 – 2	6
1 – 3	8
2 – 4	5
2 – 5	7
3 – 5	6
4 – 6	9
5 – 6	4
6 – 7	5

- a) Draw the arrow network diagram.  
b) Calculate earliest and latest event times.  
c) Identify the critical path and total project duration.