

**First Year MHA Degree Regular/Supplementary Examinations  
September 2023**

**Operations Research  
(Common for 2013 and 2016 Scheme)**

**Time: 3 Hours**

**Max Marks: 100**

- Answer all questions to the point neatly and legibly • Do not leave any blank pages between answers • Indicate the question number correctly for the answer in the margin space
- Answer all parts of a single question together • Leave sufficient space between answers
- Draw table/diagrams/flow charts wherever necessary • Ordinary calculator can be used

**Essays:**

**(2x20=40)**

1. Solve the below LP scenario using Simplex method

Let T = Number of tables to produce

C = Number of chairs to produce

Maximize Profit = (\$20)T + (\$15)C

subject to

$$2T + C \leq 6 \text{ large bricks}$$

$$2T + 2C \leq 8 \text{ small bricks}$$

and

$$T \geq 0, C \geq 0.$$

2. For the project below,

- a) Identify the various paths.
- b) Identify the critical path and explain its relevance.
- c) What is the shortest completion time of project.
- d) Compute ES/EF/LS/LF and the slack.

Activity	Designation	Immed. Pred.	Time (Weeks)
Assess customer's needs	A	None	2
Write and submit proposal	B	A	1
Obtain approval	C	B	1
Develop service vision and goals	D	C	2
Train employees	E	C	5
Quality improvement pilot groups	F	D,E	5
Write assessment report	G	F	1

**Short Essays:**

**(2x10=20)**

3. Outline the relevance of EOQ/Reorder level and Safety stock in managing inventory.
4. Outline the different logics used in sequencing process with examples.

**Short notes:**

**(8x5=40)**

5. Outline the reasons for queues in services and the challenges in managing queues.
6. What are the typical characteristics of an A class item in inventory management.
7. Discuss how simulation model can be used to predict OP load in a hospital.
8. What does dominance signify in Game theory.
9. What are the potential limitations of OR in decision making.
10. How does balanced and unbalanced scenario differ in transportation model formulation.
11. What factors determine lead time in procurement. Discuss the relationship between lead time and inventory levels.
12. What are the differences between Group vs individual replacement in capital equipment decision making.