

First Year MHA Degree Supplementary Examinations March 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. A manufacturer has arrived at the below algebraic model in its attempt of solving an LP model.

Solve the model by using simplex method.

Let D = the number of doors to produce

W = the number of windows to produce

Maximize P(Profit) = 300D + 500W

subject to

$D \leq 4$

$2W \leq 12$

$D \geq 0, W \geq 0.$

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 path variance

Activity	Predecessor	Optimistic time	Most likely time	Pessimistic time
A	-	1	3	4
B	A	2	4	6
C	B	2	3	5
D	-	3	4	5
E	D	3	5	7
F	E	5	7	9
G	-	2	3	6
H	G	4	6	8
I	H	3	4	6

Short Essays:

(2x10=20)

3. Discuss the utility of ABC analysis as an inventory control tool. What could be the possible differences in approach in managing A/B/C items.
4. Discuss with example the approach used by Decision Theory in arriving at the most optimal decision alternative.

Short notes:

(8x5=40)

5. What lessons does the Newspaper boy problem give in managing inventory in hospitals.
6. Outline a few areas where OR is applied in decision making in healthcare.
7. What kind of challenges are addressed through an assignment model in LP.
8. Discuss the distributions in play while studying arrival and departure in a queuing system.
9. What is the difference between decision making in uncertainty and certainty.
10. Outline two areas where Simulation can be used in decision making in hospitals.
11. Discuss the challenges involved in Too low inventory and very high inventory.
12. With example explain the Zero-Sum game concept in Game theory.