

12623

[Graph Paper

M.B.A. 2 Year 3rd Semester (CBCS)

2019-20 New Scheme

Examination, November-2023

OPERATIONS RESEARCH

Paper- 20IMG23C3

Time allowed : 3 hours]

[Maximum marks : 80

Note: Attempt compulsory Question No. 1 from Section-A and four questions from Section - B one question from each Unit. - All questions carry equal marks.

Section-A

- Briefly discuss / illustrate the following:
 - Meaning of operations research
 - Constraints in LPP
 - Unbalanced transportation problem
 - Objective of assignment model
 - Critical activities
 - Decision tree
 - Assumptions of queuing theory
 - Limitations of game theory

Section-B

Unit-I

- Discuss the essential characteristics of Operations Research (OR). What are the phases in OR study?

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- Solve the following LPPs graphically:

(a) $\text{Max } z = 8x_1 + 16x_2$

Subject to

$$x_1 + x_2 \leq 200$$

$$x_2 \leq 125$$

$$3x_1 + 6x_2 \leq 900$$

$$x_1, x_2 \geq 0$$

- (b) Minimize $z = 3x_1 + 5x_2$

Subject to

$$-3x_1 + 4x_2 \leq 12$$

$$2x_1 - x_2 \geq -2$$

$$2x_1 + 3x_2 \geq 12$$

$$x_1, x_2 \geq 0$$

Unit-II

- Solve the following transportation problem for maximising the total revenue.

To \ From	P	Q	R	S	Total (Units)
A	12	10	12	13	500
B	7	11	8	14	300
C	6	16	11	7	200
Total (units)	180	150	350	320	1000

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5. Solve the following travelling salesman problem for minimising the total distance and visiting each city only once:

To \ From	A	B	C	D	E
A	—	103	188	136	38
B	103	—	262	176	52
C	187	262	—	85	275
D	136	176	85	—	162
E	38	52	275	162	—

Unit-III

6. Three time estimates (pessimistic - t_p , most likely- t_m , optimistic - t_o), in days, of a PERT project are shown below:

Activity	1-2	2-3	2-4	3-5	3-6	4-6	5-7	6-7	7-8
t_o	4	5	4	15	10	8	4	12	6
t_m	6	7	8	20	18	9	12	15	9
t_p	8	15	12	25	26	16	14	18	12

Draw the network, identify the critical path and determine EST, EFT, LST and LFT for each activity.

7. (a) Differentiate between PERT and CPM.
 (b) Discuss the steps involved in the decision making process.

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- (c) What is the dummy activity? Why do we need dummy activities?

Unit-IV

8. Using suitable examples, explain and illustrate the following:

- Pure strategies
- Mixed strategies
- Rule of dominance
- Value of a game

Discuss the process, advantages, limitations and applications of simulation.

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