1605E688

Candidate's Seat No :_____

MITF Sem.-4 Examination

MITF-209T

Management Science

May-2025

Time : 2-30 Hours] **[Max. Marks : 70**

Instructions:

- **Figures to the right indicate Full Marks.**
- **Do not write anything on the question paper.**
- **Simple calculator is allowed. Do not use a scientific calculator.**

Q.1 Write short notes on the decision criteria under uncertainty: Maximin, Minimax Regret, Hurwicz Criterion, Laplace Criterion. [14]

OR

A newspaper boy has the following probabilities of selling a magazine. [14]

No. of copies sold	Probability
10	0.10
11	0.15
12	0.20
13	0.25
14	0.30

Cost of copy is 30 and sale price is 50 paise. He cannot return unsold copies.

(a) Construct a conditional profit table.

(b) Determine EPPI.

Q.2 Explain the principle of dominance in game theory. [14]

OR

Two players *A* and *B* showing each other, put on a table a coin, with head or tail up. Given the choice of being matching player (*A*) or non-matching player (*B*). Using oddments method what is the value of game? [14]

		Player B	
		B_1	B_2
Player A	A_1	8	-3
	A_2	-3	1

Q.3 Determine the basic feasible solution to the following transportation problem using North-west Corner Method and Least Cost Method. [14]

		Distribution Centres				
		D_1	D_2	D_3	D_4	Supply
Sources	S_1	2	3	11	7	6
	S_2	1	0	6	1	1
	S_3	5	8	15	9	10
	Requirements	7	5	3	2	

OR

(P.T.O)

<table>
<tr><td></td><td>Describe the Hungarian Method for solving an assignment problem. How is it used to minimize total cost? Provide an example.</td><td>[14]</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Q.4</td><td>Construct a network diagram and find the total, free and independent floats of various activities.
<table>
<tr><td>Activity</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td></tr>
<tr><td>Predecessor.</td><td>-</td><td>A</td><td>A</td><td>B, C</td><td>-</td><td>E</td></tr>
<tr><td>Duration</td><td>2</td><td>3</td><td>4</td><td>6</td><td>2</td><td>8</td></tr>
</table></td><td>[14]</td></tr>
<tr><td></td><td><u>OR</u></td><td></td></tr>
<tr><td></td><td>What is float (total, free, independent float)? How is it calculated in a network? Why is it important?</td><td>[14]</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Q.5</td><td>Answer the following. (Attempt any SEVEN out of TWLEVE)</td><td>[14]</td></tr>
<tr><td>1.</td><td>What is the purpose of slack variables in linear programming?</td><td></td></tr>
<tr><td>2.</td><td>Define: Zero Sum Game</td><td></td></tr>
<tr><td>3.</td><td>How is the Expected Value of Perfect Information (EVPI) calculated?</td><td></td></tr>
<tr><td>4.</td><td>Define: Latest Finish Time (LFT) of an activity</td><td></td></tr>
<tr><td>5.</td><td>How many possible assignments exist in an assignment problem with 4 workers and 4 tasks?</td><td></td></tr>
<tr><td>6.</td><td>What is the difference between certainty and uncertainty in decision-making?</td><td></td></tr>
<tr><td>7.</td><td>The Hungarian method is used to solve _____.</td><td></td></tr>
<tr><td>8.</td><td>Define: Critical Path</td><td></td></tr>
<tr><td>9.</td><td>Define: Slack Time</td><td></td></tr>
<tr><td>10.</td><td>What does PERT stand for?</td><td></td></tr>
<tr><td>11.</td><td>Name the decision-making criterion suitable for a pessimistic decision-maker.</td><td></td></tr>
<tr><td>12.</td><td>What is the formula for expected time in PERT?</td><td></td></tr>
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