



RAN-1189

B.Sc. Sem-VI Examination

March / April - 2019

Mathematics-MTH-6001 (EG)

(Operations Research-II)

સૂચના : / Instructions

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the details of signs on your answer book

Name of the Examination:

B.Sc. Sem-VI

Name of the Subject :

Mathematics - MTH - 6001 (EG)

Subject Code No.:

1

1

8

9

Seat No.:

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

Student's Signature

Instruction:

- (1) All questions are compulsory.
- (2) Figures to the right indicate marks of the question.
- (3) Follow usual notations.
- (4) Use of non-programmable calculator is allowed.
- (5) Total marks **50**.

Que:1 (a) Answer any TWO as directed.

[06]

- (1) Write two applications of the assignment problem.
- (2) Solve the following Assignment problem:

	<i>I</i>	<i>II</i>	<i>III</i>
A_1	10	8	6
A_2	6	7	9
A_3	9	12	10

- (3) Write the general mathematical form of Transportation problem.

Que:1 (b) Attempt any ONE.

[04]

- (1) Consider the game with following payoff table. Determine the value of the game.

<i>Player A</i>	<i>Player B</i>	
	<i>B1</i>	<i>B2</i>
<i>A₁</i>	7	-2
<i>A₂</i>	5	4

- (2) Consider the game with following payoff table. Determine the value of the game.

<i>Player A</i>	<i>Player B</i>	
	<i>B1</i>	<i>B2</i>
<i>A₁</i>	-3	4
<i>A₂</i>	2	-1

Que:2 Attempt any TWO.

[20]

- (1) Find the assignment of workers to machines that will minimize the total time taken.

		<i>Machines</i>				
		<i>M₁</i>	<i>M₂</i>	<i>M₃</i>	<i>M₄</i>	<i>M₅</i>
<i>Manufacturers</i>	<i>A₁</i>	25	28	29	28	31
	<i>B₂</i>	31	29	30	31	29
	<i>C₃</i>	27	26	28	27	26

- (2) Solve the Assignment Problem:

		<i>Jobs</i>				
		<i>J₁</i>	<i>J₂</i>	<i>J₃</i>	<i>J₄</i>	<i>J₅</i>
<i>Employee</i>	<i>E1</i>	5	5.1	4.2	5.7	4.9
	<i>E2</i>	5.1	1.5	5.8	6	4.3
	<i>E3</i>	6.5	5.5	4.6	6.4	6

(3) Solve the Assignment Problem:

		<i>Salesmen</i>				
		<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>D</i>
<i>Counters</i>	<i>I</i>	25	30	38	50	15
	<i>II</i>	28	26	35	50	20
	<i>III</i>	30	35	40	55	18
	<i>IV</i>	15	25	30	48	12
	<i>V</i>	30	27	32	48	16

(4) Use graphical method to solve the following game and find the value of the game.

		<i>Player B</i>			
		<i>B₁</i>	<i>B₂</i>	<i>B₃</i>	<i>B₄</i>
<i>Player A</i>	<i>A₁</i>	1	4	6	8
	<i>A₂</i>	8	3	4	2

Que:3 Attempt any TWO.

[20]

- (1) Find an initial basic feasible solution for the following Transportation problem using
- North west corner method
 - Least cost method.

		<i>Destinations</i>				<i>Supply</i>
		<i>D₁</i>	<i>D₂</i>	<i>D₃</i>	<i>D₄</i>	
<i>Sources</i>	<i>S₁</i>	21	6	15	3	110
	<i>S₂</i>	17	18	4	23	130
	<i>S₃</i>	32	27	18	14	190
<i>Demand</i>		60	100	120	150	

- (2) Determine an optimal solution for the following transportation problem using MODI method:

		<i>Destinations</i>				<i>Supply</i>
		<i>D₁</i>	<i>D₂</i>	<i>D₃</i>	<i>D₄</i>	
<i>Sources</i>	<i>S₁</i>	3	6	8	5	20
	<i>S₂</i>	6	1	2	5	28
	<i>S₃</i>	7	8	3	9	17
<i>Demand</i>		15	19	13	18	

(3) Solve the following transportation problem:

		<i>Destinations</i>					<i>Supply</i>
		<i>D₁</i>	<i>D₂</i>	<i>D₃</i>	<i>D₄</i>	<i>D₅</i>	
<i>Sources</i>	<i>S₁</i>	5	3	4	6	4	4
	<i>S₂</i>	4	3	10	5	6	2
	<i>S₃</i>	4	6	9	4	3	4
<i>Demand</i>		2	1	2	3	2	

(4) Use graphical method to solve the following game and find the value of the game.

		<i>Player B</i>	
		<i>B₁</i>	<i>B₂</i>
<i>Player A</i>	<i>A₁</i>	2	5
	<i>A₂</i>	4	6
	<i>A₃</i>	3	3
	<i>A₄</i>	8	7
	<i>A₅</i>	4	8
	<i>A₆</i>	5	4