Roll No.							

24-MA-44

M.Sc. IV SEMESTER [MAIN/ATKT] EXAMINATION
JUNE - JULY 2024

MATHEMATICS
Paper - IV
[Operations Research - II]

[Max. Marks : 75] *[Time : 3:00 Hrs.]* *[Min. Marks : 26]*

Note : Candidate should write his/her Roll Number at the prescribed space on the question paper.
Student should not write anything on question paper.
Attempt five questions. Each question carries an internal choice.
Each question carries **15 marks.**

Q. 1 a) Obtain the initial basic solution of the transportation problem -

From / To	X	Y	Z	Supply
A	4	8	8	76
B	16	24	16	82
C	8	16	35	77
Demand	72	102	41	

b) Write Mathematical formulation of Transportation Model.

OR

a) Determine initial basic feasible solution by North - West corner rule.

From / To	1	2	3	4	Supply
A	2	3	11	7	6
B	1	0	6	1	1
C	5	8	15	9	10
Demand	7	5	3	2	

b) Explain least cost method in detail.

Q. 2 a) Find the assignment of machinist to jobs that will result in Maximum Profit.

Machinist	Jobs				
	A	B	C	D	E
1	62	78	50	101	82
2	71	84	64	73	59
3	87	92	111	71	81
4	48	64	87	77	80

b) Give introduction of assignment problem.

OR

a) Draw the flow chart of Hungarian or Reduced matrix method.

b) Find optimum assignment for the problem.

	S_1	S_2	S_3	S_4	S_5
B_1	4	6	7	5	11
B_2	7	3	6	9	5
B_3	8	5	4	6	9
B_4	9	12	7	11	10
B_5	7	5	9	8	11

Q. 3 a) Write down general rules of Network construction in detail.

b) Construct a Network diagram.

Activity	Time	Activity	Time
1-2	4	5-6	4
1-3	1	5-7	8
2-4	1	6-8	1
3-4	1	7-8	2
3-5	1	8-20	5
4-9	5	9-10	7

OR

a) What is critical path explain in detail.

b) Explain objective of Network Technique.

Cont. . . .

Q. 4 a) Write advantages and limitation of Simulation.

b) A bakery keeps stock of a brand of cakes previous experience shows the daily demand pattern for the item with associated probabilities is as

Daily Demand	0	10	20	30	40	50
Probability	.01	.02	.15	.5	.12	.02

use given sequence of random number to simulate demand for next 10 days also find out the average demand per days.
Random No. 25, 39, 65, 76, 12, 05, 73, 89, 19, 49

OR

a) Explain application of Simulation.

b) Explain Montecarlo method of Simulation.

Q. 5 a) Solve the Game using dominance method -

		Player B		
		B_1	B_2	B_3
Player A	A_1	1	3	1
	A_2	0	–4	–3
	A_3	1	5	–1

b) State Necessary and sufficient condition of Kuhn - Tucker conditions.

OR

a) Solve for optimum result -

		Player B			
		B_1	B_2	B_3	B_4
Player A	A_1	6	2	4	8
	A_2	2	–1	1	12
	A_3	2	3	3	9
	A_4	5	2	6	10

b) What is Saddle point and write the rules for determine saddle point.

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