



	WINTER-2023		
	Exam Seat No.:		
	Academic Year:2023-2024	Semester:III	
	Name of Programme:MBA	Pattern:2022	
	Name of Course:Decision Science	Course Code:MBA22 3 0 02	
	Max. Marks:60	Duration: 2 Hrs 30 Min	

	<p>Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.</p> <ol style="list-style-type: none">1. This question paper contains 5 page(s).2. Answer to each new question is to be started on a new page.3. Assume suitable data wherever required, but justify it.4. Draw the neat labelled diagrams, wherever necessary.5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.6. Q1 and Q2 are compulsory. Solve (a) or (b) and (c) or (d) from Q3 to Q5	
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Question No. 1 Attempt following Question

- 1a) Calculate Quartile Deviation as well as Coefficient of Quartile Deviation for below data.

(6) CO2

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No of Students	10	20	30	50	40	30

Question No. 2 Attempt following Question

- 2a) There are 400 students in the class. Marks of the students are randomly distributed with mean 42 and standard deviation 4.

CO2

Find the number of students who scores

- 1) More than 50 marks
- 2) Less than 50 marks
- 3) Less than 40 marks
- 4) Greater than 40 marks
- 5) Between 43 and 46 marks

Question No. 3 Attempt following Question

- 3a) Solve the below Transportation Problem and find Initial Basic Solution by North West corner Rule method and also find Optimum Solution by MODI method.

(8) CO3

	Destination				
Source	D ₁	D ₂	D ₃	D ₄	Supply
S ₁	3	1	7	4	300
S ₂	2	6	5	9	400
S ₃	8	3	3	2	500
Demand	250	350	400	200	

OR

- 3b) Solve the below Transportation Problem and find Initial Basic Solution by VAM method and also find Optimum Solution by MODI method. (8) CO3

	A	B	C	D	Availability
D1	20	22	17	04	120
D2	24	37	09	07	70
D3	32	37	20	15	50
Demand	60	40	30	110	

- 3c) Solve the following assignment problem for maximising the production output. The data refers to the production of an article for the given operators and machines. (8) CO3

	Machines			
Operators	A	B	C	D
1	10	5	7	8
2	11	4	9	10
3	8	4	9	7
4	7	5	6	4
5	8	9	7	5

OR

- 3d) The personal manager of ABC Co. wants to assign Mr. X, Y and Z to the regional offices for which the costs are given. But the firm also has an opening in its Chennai office and would send one of them to that branch if it is more economical than a move to Delhi, Mumbai or Kolkata. (8) CO3

	Office		
Mr.	D	M	K
X	1600	2000	2400
Y	1000	3200	2600
Z	1000	2000	4600

It will cost Rs. 2000 to relocate Mr. X to Chennai, Rs 1600 to relocate Mr. Y there and Rs. 3000 to move Mr. Z. What is the optimum assignment of personnel to the offices?

Question No. 4 Attempt following Question

- 4a) A project has been defined to contain the following list of activities along with their required time of completion. (8) CO3

Activity	A	B	C	D	E	F	G	H	I
Time in Days	1	4	3	7	6	2	7	9	4
Immediate Predecessor	-	A	A	A	B	C	E,F	D	G,H

- Draw Network Diagram
- Calculate Forward Pass and Backward Pass
- Identify Critical Path

OR

- 4b) In a service department manned by one server, on an average one customer arrives every 10 minutes. It has been found that each customer requires 6 minutes to be served find out. (8) CO2

- Average Queue Length
- Average number of customers in the system
- Average waiting time of customer in the queue
- Average waiting time of customer in the system

- 4c) Discuss the concept of Queuing Theory and various terminologies used in it. (8) CO 1

OR

4d) Given the Following Information:

(8) CO3

Activity	Optimistic Time (Weeks)	Pessimistic Time (Weeks)	Most Likely Time (Weeks)
1-2	6	8	7
1-3	1	9	2
1-4	1	7	4
2-6	1	3	2
3-5	1	9	2
4-5	1	9	5
4-7	2	8	2
5-6	4	4	4
5-7	4	10	4
6-8	2	14	5
7-8	2	8	2

a. Construct Project Network Diagram

b. Find the expected duration

Find Critical Path

Question No. 5 Attempt following Question

- 5a) A food products' company is contemplating the introduction of a revolutionary new product with new packaging or replacing the existing product at much higher price (S₁). It may even make a moderate change in the composition of the existing product, with a new packaging at a small increase in price (S₂), or may make a small change in the composition of the existing product, backing it with the word 'New' and a negligible increase in price (S₃). The three possible states of nature or events are: (i) high increase in sales (N₁), (ii) no change in sales (N₂) and (iii) decrease in sales (N₃). The marketing department of the company worked out the payoffs in terms of yearly net profits for each of the strategies of three events (expected sales). This is represented in the following table:

State of Nature	Strategy		
	S1	S2	S3
N1	7,00,000	5,00,000	3,00,000
N2	3,00,000	4,50,000	3,00,000
N3	1,50,000	0	3,00,000

From the following payoff matrix calculate:

- a. Maximin
- b. Maximax
- c. Laplace
- d. Minimax regret

OR

5b) Explain the rule of dominance in Game without saddle point (proper Steps are required.) (8) CO 1

5c) Solve the following game (8) CO3

Player A	Player B		
	B1	B2	B3
A1	1	7	2
A2	6	2	7
A3	5	1	6

OR

5d) Mr. Ram flies quite often from town A to town B. He can use the airport bus which costs Rs 25 but if he takes it, there is a 0.08 chance that he will miss the flight. The stay in a hotel costs Rs 270 with a 0.96 chance of being on time for the flight. For Rs 350 he can use a taxi which will make 99 per cent chance of being on time for the flight. If Mr Ram catches the plane on time, he will conclude a business transaction that will produce a profit of Rs 10,000, otherwise he will lose it. Which mode of transport should Mr Ram use? Answer on the basis of the EMV criterion. (8) CO4