

Code:19MB1T06

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SWARNANDHRA COLLEGE OF ENGINEERING & TECHNOLOGY
[AUTONOMOUS]Seetharampuram, NARSAPUR-534 280

MBA.I Semester

[OUTCOME BASED EDUCATION PATTERN]

QABD

UNIT-1

1.a) Define slack and surplus variables in a linear programming problem

b) Solve the following LPP by graphical method

$$\text{Max. } Z = 40X_1 + 80X_2$$

$$\text{S.T.C } 2X_1 + 3X_2 \leq 48$$

$$X_1 \leq 15$$

$$X_2 \leq 10;$$

$$\text{and } X_1, X_2, \geq 0$$

2 Solve the following LPP by simplex method

$$\text{Max. } Z = 3X_1 + 2X_2 + 5X_3$$

$$\text{S.T.C } 2X_1 + 2X_2 + X_3 \leq 430$$

$$3X_1 + 2X_3 \leq 460$$

$$X_1 + 4X_2 \leq 420; \text{ and } X_1, X_2, X_3 \geq 0$$

3. Solve the following Linear program problem by Two-phase method

$$\text{Mini. } Z = X_1 - 2X_2 - 3X_3$$

$$\text{S.T.C } -2X_1 + X_2 + 3X_3 = 2$$

$$2X_1 + 3X_2 + 4X_3 = 1$$

$$\text{and } X_1, X_2, X_3 \geq 0$$

UNIT-2

1. Determine the optimal solution for the following transportation problem

	D ₁	D ₂	D ₃	D ₄	D ₅	a _i
O ₁	4	7	3	8	2	4
O ₂	1	4	7	3	8	7

O ₃	7	2	4	7	7	9
O ₄	4	8	2	4	7	2
b _j	8	3	7	2	2	

2 a) Formulate the mathematical model of the assignment problem

b) Determine the assignment such that total sales maximum and the effectiveness matrix is given by

	I	II	III	IV
A	42	35	28	21
B	30	25	20	15
C	30	25	20	15
D	24	20	16	12

3) A manufacture has distribution centers x, y, z. These centers have availability 8 4 8 units of his product. His retail out lets at A, B, C, D and E require 5 2 4 6 3 units respectively. The transport cost (in rupees) per unit between each centre out let is given below.

Distribution centre	Retail out lets				
	A	B	C	D	E
X	55	30	40	50	40
Y	35	30	100	45	60
Z	40	60	95	35	30

Determine the optimal distribution to minimize the cost of transportation

UNIT-3

1. Two competitors A and B are competing for the same product .Their different strategies are given in the following payoff matrix:

CompanyA /B	I	II	III	IV
I	3	2	4	0
II	2	4	2	4
III	4	2	4	0
IV	0	4	0	8

Use dominance principle to find the optimal strategies

2. Solve the following game graphically.

3. a) Explain MAXIMA-MINIMAX principle.
 b) Solve the following payoff matrix: determine the optimal strategies and the value of game.

		B	
A	5	1	
	3	4	

4. a) Solve the game given below and find its value and strategies for A and B

		Player B					
Player A		B ₁	B ₂	B ₃	B ₄	B ₅	B ₆
	A ₁	2	2	4	5	3	3
	A ₂	4	3	6	6	4	4
	A ₃	6	5	4	5	2	5
	A ₄	3	4	5	7	3	4

- b) Explain what is ment by “two person zero sum game” ?
 5. Describe the “maximim” principle of game theory. What do you understand by pure , strategies mixed strategies and saddle point ?
 6. In a game of matching coins with two players suppose A wins one unit of value when there are two heads, wins nothing when there are two tails and losses ½ unit of value when there are one head and one tail. Determine the payoff matrix, the best strategies for each player and the value of game to A.

UNIT-4

1. A newspaper boy has the following probabilities of selling a magazine

	No.of copies sold	Probability
	10	0.10
	11	0.15
	12	0.20
A ₁	13	0.25
A ₂	14	0.30
A ₃	3	5
A ₄	4	1
A ₅	3	4
A ₆	-7	6

Cost of a copy is 30 paise and sale price is 50 paise. He cannot return unsold copies. How many copies should he order ?

2. What do you mean by decision analysis? Explain different types of decisions and discuss important components of decision making
3. A) Briefly explain different types of decision making environment
B) Explain Laplace criterion and Hurwicz criterion with working procedure
4. What is probability introduction to decision theory? Explain the steps in decision making
5. What techniques are used to solve decision making problems under uncertainty? Which technique results in an optimistic decision?
6. A shop keeper buy vegetable puff at Rs.2 and sells it at Rs.5. Unsold puffs are given to poor people at free of cost. The following is the sales details during past 100 days.

Daily sales of puffs	10	11	12	13
No. of days sold	15	20	40	25

Apply EMV criterion to determine how many puffs the shop keeper has to stock every day in order to maximize the profit

7. What are the different environment in decision making ? Explain them
8. A businessman has two independent investment portfolios A and B , available to him, but he lacks the capital to undertake both of them simultaneously. He can either choose A first and then stop, or if A is successful, then take, B or *vice versa* . The probability of success of A is 0.6, while for B it is 0.4. Both investment schemes require an initial capital outlay of Rs.10,000 and both return nothing if the venture proves to be unsuccessful. Successful completion of A will return Rs.20,000(over cost) and successful completion of B will return Rs.24,000(over cost). Draw a decision tree in order to determine the best strategy.

UNIT-5

1. a) Write a short notes on the sequencing decision problem for 'n' jobs on 'two' machines
b) Find the sequence for the following eight jobs, that will minimize the total elapsed time for the completion of all the jobs .Each job is processed in the same order CAB

Jobs		1	2	3	4	5	6	7	8
MICS	A	4	6	7	4	5	3	6	2
	B	8	10	7	8	11	8	9	13

	C	5	6	2	3	4	9	15	11
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2. Explain the principle assumptions made while dealing with sequencing problem.

3. Find the sequence that minimizes the total elapsed time (in hrs) required to complete the following tasks on two machines. Also find the idle times of machines.

Task	A	B	C	D	E	F	G	H	I
Machine 1	2	5	4	9	6	8	7	5	4
Machine 2	6	8	7	4	3	9	3	8	11

4. a) Write the rules for the drawing net work

b) The activities along with their dependency relationships are given below. Draw the net work diagram and find the critical path and duration of the project

Activity	A	B	C	D	E	F	G	H	I	J
Immediate Predecessor	-	-	A, B	A, B	B	C	D	F, G	F, G	E, H
Duration(weeks)	4	3	2	5	6	4	3	7	4	2

5. Draw network diagram to the following and calculate the critical path, minimum duration of the project, earliest and latest estimates and floats

Activity	1-2	1-3	2-4	2-5	3-5	4-6	4-7	5-7	6-8	7-8
Duration	2	2	3	4	5	2	2	3	3	3

6. Define terms slack, flot, EST, EFT, LST, LFT. Explain with an example of your choice

7. Consider a PERT network from the following information and determine the critical path

Activity	Immediate predecessor	t_0	t_m	t_p
A	-	1	2	3
B	A	2	4	6
C	A	2	6	10
D	B	6	8	10
E	C	4	6	8
F	C	6	10	14
G	E	8	10	12
H	F	12	14	16
I	G, H	4	8	12
J	G, H	10	12	14
K	I	2	4	6
L	J	6	10	14

Assuming that the schedule allows 40 days to complete the whole project, calculate probability of completion by the schedule date.

8. A project is composed of seven activities, where time estimates are listed in the following table activities are identified their beginning (i) and ending (j) node number.

Activity(i- J)	Optimistic time	Pessimistic time	Most likely time
1-2	0.7	1.3	1.0
2-3	3.8	9.8	5.6
2-4	5.2	12.4	7.6
3-4	2.1	6.1	2.7
4-5	0.7	3.7	3.4
5-6	0.7	1.3	1.0

i) Find the expected duration and standard deviation for activity

ii) What is the probability that the project will be completed two weeks ahead of the expected time

9. A project has the following time schedule

Activity	Time in months
1-2	2
1-3	2
1-4	1
2-5	4
3-6	8
3-7	5
4-6	3
5-8	1
6-9	5
7-8	4
8-9	3

Draw a network and compute

i) Critical path and duration ii) Total float for each activity

10. a) Write the rules for drawing network

b) A project is represented by the network given below and has the following data

Task	A	B	C	D	E	F	G	H	I
Optimistic time	2	3	5	5	8	7	9	3	6
Most likely time	3	5	8	7	10	9	11	8	8

Pessimistic time	4	7	11	9	12	11	13	13	10
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- i) Draw the network diagram ii) Determine the critical path

11.a) Define various time estimates of activities of a project?

b) the various time estimates of activities involved in a project are given in the following table

Activities	1-2	1-3	2-4	2-3	3-4	3-5	4-6	5-6
t_o	2	4	2	2	0	3	6	1
t_m	6	8	3	4	0	6	10	3
t_p	10	12	4	6	0	9	14	5

- i) Determine the expected completion time of the project

.ii) Determine the variance and standard deviation of the project.