

①: 18/2/2017
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VCD

SYBAF SEM III QMB- MARKS 75 2HRS30MIN

- Note: - 1) All questions are compulsory and carry equal marks.
2) Figures to right indicate full marks to corresponding sub question.
3) Use of simple calculator is allowed.

Q. 1 A). Attempt any eight of the following match the pairs.

(8)

A	
1. Graphical representation of decision problem	a. artificial variable
2. Expected payoff with perfect information	b. towards the origin
3. Expected Monetary Value	c. away from the Origin
4. Expected opportunity loss	d. decision tree
5. Maximax Criteria	e. EMV
6. Slack Variable	f. EPPI
7. Laplace	g. EOL
8. Maximization	h. criteria of optimism
9. Minimization	i. probability of event
10. Assignment optimality	j. number of lines = matrix

Q.1B). Attempt any seven True or False.

(7)

1. The transportation problem is balanced if Demand is equal to Supply.
2. North-West corner method is solution to assignment problem.
3. Transportation problem means one to one allocation.
4. Opportunity loss table will contain all positive values.
5. The Hungarian method is designed to solve assignment problem efficiently.
6. The best act to select using EMV and EOL are same.
7. An assignment problem may have more than one optimal solution.
8. Decision variable in LPP should be either zero or negative.
9. State of nature are under the control of decision maker.
10. A constraint is called redundant when it does not affect the solution.

Q. 2 A) Five books are placed at random in a shelf. Find probability that a particular pair of book shall be 1) Always together 2) never together.

(8)

Q. 2 B) A decision maker is faced with three alternatives and four states of nature. Following is the payoff table. Construct a decision tree and using EMV criteria find the optimum decision. (7)

State nature	S1	S2	S3	S4
acts				
A1	18	12	15	8
A2	15	14	10	11
A3	13	16	19	15
Probability	0.3	0.3	0.25	0.15

OR

Q. 2 P) A bag contains 10 white and 11 black balls. Two balls are drawn simultaneously from the bag. Find the probability of getting 1) both white balls 2) one white and one black balls 3) no white balls. (8)

Q. 2 Q) A management is faced with problem of choosing one of the three products for manufacturing. The potential demand for each product may be good, fair or poor. The probabilities of each type of demand and the payoff table are given below. Find the optimum decision using EMV and EOL criteria. (7)

Product	Probability of Demand		
	Good	fair	Poor
A	0.7	0.15	0.15
B	0.6	0.3	0.1
C	0.4	0.3	0.3

Payoff Table

Products	Type of Demand in 1000 Rs.		
	Good	Fair	Poor
A	40	15	-5
B	50	20	-6
C	55	25	12

Q. 3 A) Solve the following LLP by simplex method

$$\text{Max } Z = 3x_1 + 2x_2 + 5x_3$$

$$\text{Subject to } x_1 + 2x_2 + x_3 \leq 430$$

$$3x_1 + 2x_3 \leq 460$$

$$x_1 + 4x_3 \leq 420, x_i \geq 0 \text{ for } i = 1, 2, 3$$

OR Q. 3 P) An airline agrees to charter planes for a group. The group needs atleast 160 first class (15) seats and atleast 300 tourist class seats. The airline must use atleast two of its model 314 planes which have 20 first class and 20 tourist class seats. The airline will also use some of its model 535 planes which have 20 first class seats and 60 tourist class seats. Each flights of model 314 planes cost the company Rs1 lakh and each flight of a model 535 planes costs Rs1.5lakh. How many of each type planes should be used to minimize the total flight costs. Solve graphically.

Q. 4 A) There are three plants A, B, C with capacity 1000, 1000, 2000 units. They supply to four (15) ware houses P, Q, R, S with demands of 500, 500, 1400, 500 units. Find IFS by VAM and method optimal solution by modified distribution method

Plants \ WH	P	Q	R	S
A	40	50	20	50
B	30	80	40	80
C	70	40	70	40

OR Q. 4 P) A project work consist of four major job for which four contractor have submitted tenders. The tenders amounts are given in table. Find the assignment which minimize the total cost (15)

	J1	J2	J3	J4
C1	15	29	35	20
C2	21	27	33	17
C3	17	25	37	15
C4	14	31	39	21

Q. 5 A) Explain different method of decision making under risk

Q. 5 B) Explain Methods for finding Initial / Feasible solution (IFS) (8)

OR Q. 5 P) Write short note on any three. (7)

1. Opportunity loss 2. Payoff and Payoff table 3. Vogels approximation method (VAM) (15)

4. Regret matrix 5. EOL