[5465]-2004
M.B.A.
204 : DECISION SCIENCE
(2016 Pattern) (Semester - II)

Time : 2 ¼ Hours]

[Max. Marks : 50

Instructions to the candidates:
1) *Each question has an internal option.*
2) *Each question carries 10 marks.*
3) *Graph paper will not be provided.*
4) *Use of non-scientific calculator is allowed.*

Q1) Marketing manager has 5 salesmen & 5 sales districts considering the capabilities of the salesman & the nature of the district, the marketing manager estimates that sales & per month (in hundred Rs) for each salesman in each district would be as follows. **[10]**

Sales district

Salesman	A	B	C	D	E
1	32	38	40	28	40
2	40	24	28	21	36
3	41	27	33	30	37
4	22	38	41	36	36
5	29	33	40	35	39

What is a maximun sale that may be expected in an optimum assignment?

OR

A construction company moves material form three plants to three projects. Project X requires 50 truck loads, project Y requires 75 and project Z require 50 truck loads. Plant A can supply 45 truck load per week plant B can supply 60 & plant C can supply 60. Using cost information given below determine optimal transportation schedules for the company. **[10]**

Transportation cost per truck load in (Rs)

To/From	X	Y	Z
A	40	80	30
B	60	70	90
C	80	20	50

Find initial solution by using VAM.

OR

P.T.O.

Q2) Use the graphical method to solve the following LPP **[10]**

Maximize $Z = 100x + 100y$.

Subject to the constraints.

$$6x + 4y \geq 24$$
$$4x + 2y \leq 16$$
$$3.5x + 3y \leq 21$$
$$x, y \geq 0$$

OR

A bakery keeps stock of popular brand of cake. Daily demand based on past experience is given below: **[10]**

Daily Demand	0	10	20	30	40	50
Probability	0.01	0.15	0.20	0.50	0.12	0.02

Using the following random numbers simulate the demand for next 10 days.

i)   Find stock situation (unsold cake) if the owner of the bakery decides to make 30 cakes every day.

ii)   Also find average demand for the cakes on basis of simulated data.

Random Number : 45, 72, 56, 51, 79, 09, 61, 43, 31, and 81.

Q3) A manufacturing company faced with the problem of choosing from four products to manufacture. The potential demand of each product may turn out to be good, satisfactory or poor. The probabilities of each type of demand are 0.6, 0.2 and 0.2 respectively. **[10]**

Product	Profit in Rs.		
	Good	Satisfactroy	Poor
A	40,000	10,000	1,100
B	40,000	20,000	7,000
C	50,000	15,000	8,000
D	40,000	18,000	15,000

Advise the company about type of product to be manufacture using EMV criterion. Determine expected value of perfect information. Ignore probability and suggest optimum strategy using Hurwicz criteria ($\alpha = 0.7$).

OR

a) Following is the pay-off matrix in terms of increase in votes to X (loss to Y) using three different starategies available to each player for advertising. Find the optimum strategies adopted by X for the campaign. **[5]**

		Candidate Y		
	Strategies	I	II	III
Candidate X	I	300	200	100
	II	600	500	400
	III	600	400	600

b) Explain the characteristics of queuing system. **[5]**

Q4) The following are the time estimates and the precedence relationships of the activities in a project network. **[10]**

Activity	A	B	C	D	E	F	G	H	I	J	K
Immediate Predecessor Activity	-	-	-	A	B	B	C	E	D	F,G	H,1
Duration in Weeks	4	7	3	6	4	7	6	10	3	4	2

Draw the project network diagram. Determine the critical path and the project completion time.

OR

7 jobs are processed in three machines are given below. **[10]**

Jobs Machines	J1	J2	J3	J4	J5	J6	J7
M1	3	8	7	4	9	8	7
M2	4	3	2	5	1	4	3
M3	6	7	5	11	5	6	12

Determine optimal sequence of jobs and idle time of all three machines.

Q5) a) Tickets numbered from 1 to 20 are mixed up and a ticket is drawn at random. What is the probability that the ticket drawn has a number which is a multiple of 3 or 7? **[5]**

b) A card is drawn at random from a well shuffled pack. Find the probability that card is **[5]**

     i) An ace   ii) Not diamond

OR

The Indian IT employees spent on an average 77 hours logged on to the Internet while at work. Assume the times are normally distributed and that of standard deviation is 20 hours. **[10]**

a) What is the probability a randomly selected employee spent fewer than 50 hours logged on to the Internet?

b) What precentage of employees spent more than 100 hours logged on to the Internet?

c) What precentage of employee logged on to the internet between 50 to 100 hours?

     Given that

Z	1.15	1.35
Area 0 to Z	0.3749	0.4115

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