Total No. of Questions : 5]

SEAT No. :

P4673

[Total No. of Pages : 4

[5659]-204

M.B.A.

204 : DECISION SCIENCE

(2013 Pattern) (Semester - II)

Time : 2½ Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***Attempt Five questions.***
2) ***Each Question has an internal option.***
3) ***Use of scientific calculator is not allowed.***
4) ***Graph paper will not be provided, draw graph on answer paper.***

Q1) a) Solve following LPP by using Graphical method. **[10]**

Maximize $P = 5x1 + 7x2$

Subject to

$x1 + x2 \leq 4$

$3x1 + 8x2 \leq 24$

$10x1 + 7x2 \leq 35$

$x1, x2 \geq 0$

OR

b) Solve Following Minimization Assignment problem. **[10]**

Jobs →

Machines ↓	A	B	C	D	E
1	27	18	×	20	21
2	31	24	21	12	17
3	20	17	20	×	16
4	20	28	20	16	27

P.T.O.

Q2) a) The tooth care hospital provides free dental service to the patients on every Saturday morning. Dentist takes on an average, 2.5 minutes for a patient to get treatment and the actual time taken is known to vary approximately exponentially around this average. The patients arrive according to Poisson distribution with an average of 20 per hour. The administrator officer of the hospital wants to investigate the following. **[10]**

i) The fraction of the time at least dentist is idle.

ii) Probability that a patient has to wait for the service.

iii) Expected number of patients waiting in the system.

iv) The average time that a patient spends at the hospital.

OR

b) The daily demand of stationary stock is given below. Records of past 200 days shown the following distribution: **[10]**

Demand	10	20	30	40	50
No. of days	20	40	60	60	20

Trader buys the commodity at Rs. 15/- and sells at Rs. 20/- per unit. Calculate profit in 10 days and average daily profit by simulating the system. Use following random numbers. 69,01,08,74,82,20,72,14,75,12.

Q3) a) From the following payoff calculate **[10]**

State of nature	Strategy		
	S1	S2	S3
N1	4000	20000	20000
N2	-100	5000	15000
N3	6000	400	-2000
N4	18000	0	1000

i) Maximin

ii) Maximax

iii) Equal Probability (Laplace)

iv) Minimax Regret

State the optimal strategies under each criterion

OR

b) Determine optimal strategy and find value of game **[10]**

		B's Strategy			
		B1	B2	B3	B4
A's Strategy	A1	2	-2	4	1
	A2	6	1	12	3
	A3	-3	2	0	6
	A4	2	-3	7	1

Q4) a) Attempt the following. **[10]**

i) Distinguish between PERT and CPM

ii) Define EST, LST, EFT, LFT and Float

b) Following are the activities of the project. **[10]**

Activity	Most optimistic time (in Weeks)	Most Likely time (in Weeks)	Most pessimistic time (in Weeks)
1-2	6	7	8
1-3	1	2	9
1-4	1	4	7
2-6	1	2	3
3-5	1	2	9
4-5	1	5	9
4-7	2	2	8
5-6	4	4	4
5-7	4	4	10
6-8	2	5	14
7-8	2	2	8

Calculate

i) Expected time of each activity

ii) Draw a network diagram and indicate expected time on each activity

iii) Compute Earliest state time and earliest finish time of each activity

iv) Identify critical path **[10]**

Q5) a) Attempt the following.

i) The probability that a person stopping at petrol pump will get his tyre checked 0.12, the probability that he will get his oil checked is 0.29 and probability that he will get both checked is 0.07. What is the probability that the person will have neither his tyre nor oil checked, Find the probability that a person who has his oil checked will also have tyres checked, Find the probability that a person checks tyres but not oil. **[5]**

ii) A candidate is selected for an interview for three posts. For the first post there are three candidates, for the second there are 4 and for the third there are 2. What is the probability that a candidate is selected for at least one post. **[5]**

OR

b) Mean and variance of a binomial distribution are 3 and 2 respectively. Find the probability that the vitiate takes values. **[10]**

i) Exactly 2

ii) At most 2

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