Total No. of Questions : 5]

SEAT No. :

P2271

[Total No. of Pages : 3

[5465]-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 scientfic calculator is not allowed.***
4) ***Graph paper will not be provided, draw graph on answer paper.***

Q1) a) Solve the LPP by graphical method **[10]**

Maximize Z= 20x + 50y

Subject to

$2x+5y \leq 50$

$6x+3y \leq 18$

$y \leq 9$

$x,y \geq 0$

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

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

P.T.O.

b) Following is the daily demand to a coca cola bottles as per past experience. **[10]**

Daily demand	0	10	20	30	40	50
Probability	0.02	0.19	0.16	0.45	0.13	0.05

Estimate average balance stock, if the manager decides to keep 30 Coca cola bottles. Use following random numbers 47, 88, 15, 91, 57, 67, 11, 54, 60, 89

Q3) a) A shop owner has 3 alternative strategies, that he can use for business purpose. Each of these follows 4 possible states. The conditional profit pay offs for each strategy-state combination are as under. **[10]**

Strategy	States			
	N1	N2	N3	N4
S1	30	10	10	8
S2	40	-15	5	7
S3	50	20	-6	10

Find optimal decision under.

i) Maximax criterion.

ii) Regret criterion.

iii) Laplace criterion.

iv) Hurwicz Alpha Criterian (Alpha = 0.7).

OR

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

		B's Strategy			
		B1	B2	B3	B4
A's Strategy	Al	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

OR

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.

Q5) a) Two friends A & B apply for an interview. The probabilities of their selection are 1/4 and 1/5 respectively. What is the chance that **[10]**

i) One of them will be selected
ii) Both will be selected
iii) None will be selected

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