[5565]-204
M.B.A. (Semeseter - II)
204 : DECISION SCIENCE
(2013 Pattern)

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 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 maximization transportation problem by MODI Method, table shows profit per unit at each distribution center W, X, Y & Z.**[10]**

	W	X	Y	Z	Supply
A	12	18	6	25	200
B	8	7	10	18	500
C	14	3	11	20	300
Demand	180	320	100	400	

P.T.O.

Q2) a) It was found in a survey that mobility of the population in a state to the village, town and city is shown in following transition matrix. What will be the proportion of population in village, town and city after two years given that present population is 0.7, 0.2, 0.1 respectively. **[10]**

$$P = \begin{array}{c} \\ V \\ T \\ C \end{array} \begin{array}{ccc} V & T & C \\ \begin{pmatrix} 0.5 & 0.3 & 0.2 \\ 0.1 & 0.7 & 0.2 \\ 0.1 & 0.4 & 0.5 \end{pmatrix} \end{array}$$

OR

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 Criterion (Alpha = 0.7)

OR

b) Find the optimum strategies for A & B in the following game. Also obtain value of game **[10]**

B's Strategy

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

Q4) a) A project has been defined to contain the following list of activities along with their required time of competition. **[10]**

Activity	A	B	C	D	E	F	G	H	I
Duration in days	1	4	3	7	6	2	7	9	4
Immediate Predecessor	-	A	A	A	B	C	E,F	D	G,H

i) Draw a network diagram

ii) Calculate the project duration and determine critical path,

iii) Find EST & EFT for the activities.

OR

b) Explain the following in terms of PERT/CPM **[10]**

i) Earliest time

ii) Latest time

iii) Total activity float

iv) Event slack

v) 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) The incidence of certain disease is such that on average, 20% of workers suffer from it. If ten workers are selected at random, find the probability that **[10]**

i) Exactly two workers suffer from the disease

ii) Not more than two workers suffer from the disease

iii) At least nine workers suffer from the disease

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