[4970] - 2004

M.B.A. (Semester - II)
204 : DECISION SCIENCE
(2013 Pattern)

Time : 2½Hours]

[Max. Marks : 50

Instructions to the candidates :-

1) *Attempt 5(five) questions.*
2) *Each questions has an internal option.*
3) *Each question carry equal marks.(10)*
4) *Figures to the right indicate mark for questions.*
5) *Graph will not be provided, Draw a diagram on answer sheet.*
6) *Non Scientific calculator is allowed.*

Q1) Solve the following problem for maximizing the Production output. The data refers to the production of an article for the given operators and machines. **[10]**

Operators	Machines			
	A	B	C	D
1	10	5	7	8
2	11	4	9	10
3	8	4	9	7
4	7	5	6	4
5	8	9	7	5

OR

Q2) Solve the following L.P.P. using graphical method **[10]**

Minimize $Z = 6X_1 + 14X_2$

Subject to $5X_1 + 4X_2 \geq 60$

$3X_1 + 7X_2 \leq 84$

$X_1 + 2X_2 \geq 18$

$X_1, X_2 \geq 0$

P.T.O.

Q3) In a bank on an average every 15 min a customer arrives for cashing the cheque. The staff at the payment counter takes 10 min for serving a customer on an average. **[10]**

Calculate :

a) Probability that system is busy.

b) Average Queue Length.

c) Average no of customers in the bank.

d) Average waiting time of customer in queue before sevice.

OR

Q4) At a bus depo every bus should leave with driver. At the terminus they should keep two drivers as reserved if anyone on scheduled duty is sick and could not come following is the Probability distribution that driver become sick. **[10]**

No of Sick drivers	0	1	2	3	4	5
Probability	0.30	0.20	0.15	0.10	0.13	0.12

Simulate for 10 days and find utilization of reserved drivers. Also find how many days and how many buses cannot run because of non Availability of the drivers.

Use following random numbers 30,54,34,72,20,02,76,74,48,22.

Q5) Solve the following game using Principle of Dominance. **[10]**

Player B

Player A	I	II	III	IV	V	VI
1	4	2	0	2	1	1
2	4	3	1	3	2	2
3	4	3	7	−5	1	2
4	4	3	4	−1	2	2
5	4	3	3	−2	2	2

OR

Q6) A farmer wants to decide which of the 3 crops he should plant. The farmer has categorized the amount of rainfall as High, Medium and Low, Extimated profit is given below. **[10]**

Rainfall	Estimated Profit (in Rs.)		
	Crop A	Crop B	Crop C
High	8000	3500	5000
Medium	4500	4500	4900
Low	2000	5000	4000

Farmer wishes to Plant one crop. Decide the best crop using.

a) Hurwicz Alpha Criterion (Coefficient of Optimism $\alpha = 0.6$)

b) Laplace Criterion

c) Minimax Regret Criterion

Q7) The following information is gather for a project : **[10]**

Activity	Preceding Activity	Duration
A	-	1
B	A	3
C	A	4
D	A	3
E	D	2
F	B,C,E	4
G	D	9
H	D	5
I	H	2
J	F,G,I	2

a) Draw the Network Diagram.

b) Determine the Critical Path and Project Duration.

OR

Q8) Write short Notes on.

a) Concept of Network diagram with example. **[5]**

b) Dummy Activities and events with example. **[5]**

Q9) a) What is the probability that a leap year selected at random will have 53 Mondays? **[5]**

b) The daily production (in number of units) for a week in a factory is 56,59,62,57,53,60,66 units. If it is checked at random on a day, what is the probability that it will be less than the average? **[5]**

OR

Q10) a) There are three stock items, each of which can be substituted for the other. Each has stock out probability of 0.03 and is independent of others. The material manager wants to know the probability that **[5]**

i) All item are in stock

ii) No item in stock.

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

i) It is not a spade

ii) It is a face card.

ॐॐॐ