



Dec - 18

Total No. of Questions : 5]

SEAT No. :

P2187

[5465]-2004

[Total No. of Pages : 4

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 maximum sale that may be expected in an optimum assignment?

OR

A construction company moves material from 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.

- Find stock situation (unsold cake) if the owner of the bakery decides to make 30 cakes every day.
- 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	Satisfactory	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 strategies available to each player for advertising. Find the optimum strategies adopted by X for the campaign. [5]

Candidate X	Candidate Y			
	Strategies	I	II	III
	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,I
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	J1	J2	J3	J4	J5	J6	J7
Machines							
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 percentage of employees spent more than 100 hours logged on to the Internet?
- c) What percentage 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



Total No. of Questions : 5]

P1430

SEAT No. :

[Total No. of Pages : 4

[5365]-2004

M.B.A.

204: DECISION SCIENCE
(2016 Pattern) (Semester-II)

May 18

Time : 2¼Hours]

Instructions to the candidates:

[Max. Marks : 50

- 1) Each question carry equal marks.
- 2) Each question has an internal option.
- 3) Graph paper will not be provided.
- 4) Non Scientific calculator is allowed.

- Q1) a) A computer center has four expert programmers. The center needs four application programs to be developed. The head of computer center after carefully studying, estimates . The time required (in minutes) by the expert to develop the application program. Find the assignment schedule so that time will be minimized. [10]

	Programes			
	A	B	C	D
Expert 1	120	100	80	90
Expert 2	80	90	110	70
Expert 3	110	140	120	100
Expert 4	90	90	80	90

OR

- a) Discuss the role of quantitative techniques in decision making. Give an example. [5]
- b) Find the initial feasible solution using North-West corner method for the given matrix. [5]

	Store				Supply
	A	B	C	D	
Warehouse I	10	20	5	7	30
Warehouse II	13	9	12	8	20
Warehouse III	4	15	7	3	30
Warehouse IV	14	7	1	4	40
Warehouse V	3	12	5	19	50
Demand	60	60	20	10	150
					150

P.T.O.

- Q2) Solve the following LPP graphically to maximize $Z = 3x + 4y$, subject to,
 $x + y \leq 6$, and $2x + y \leq 8$, where $x \geq 0, y \geq 0$. [10]

The rainfall distribution of monsoon season is as follows.

Rainfall(in cm)	0	1	2	3	4	5
Frequency	50	25	15	5	3	2

Using the following random number-67,63,39,55,29,78,70,6,78, and 76, simulate the rainfall for next 10 days and find the average rainfall. [10]

- Q3) A businessman has three alternative actions that he can take. Each of the action can be followed by any of the four possible events. The conditional payoff for each action-event combination are as under. [10]

		Nature			
		N1	N2	N3	N4
action	S1	4	0	-5	3
	S2	-2	6	9	2
	S3	7	3	2	4

Find the optimal strategy using

- Maxmini criteria
- Laplace criteria and
- Hurwicz criteria ($\alpha = 0.6$)

OR

In a service department manned by one server, on an average one customer arrives every 10 minutes. It has been found that each customer requires 6 minutes to be served find out. [10]

- Probability that the server is idle.
- Average queue length.
- Average time spent by each. Customer in the system.
- Probability that there would be 2 customers in the queue.

Q4) Following information is gathered for a project.

[10]

Activity	Preceding activity	Duration(weeks)
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	

- Draw network diagram.
- Determine critical path and its duration.

OR

We have seven jobs, each of which has to go through two machines A&B in the order AB. The processing time for the jobs on the two machines (in hrs) are given as,

Job	1	2	3	4	5	6	7
Machine A	3	12	15	6	10	7	11
Machine B	8	10	10	6	12	1	3

Determine the sequence of these jobs to minimized total elapsed time. T. [10]

Q5) A card is drawn from a pack of cards. What is the chance of drawing a red queen given that the card drawn was a face card. [10]

OR

In a sample of 1000 scores, the mean of a certain test is 14 and the standard deviation is 2.5. Assuming the distribution to be normal, find. [10]

- a) How many students have scored between 12 and 15 ?
b) How many scored above 18?

(Given Z at 0.8 = 0.2881

Z at 0.4 = 0.1554

Z at 1.6 = 0.4452)

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Total No. of Questions : 5]

P3865

SEAT No. :

LIBRARY

[Total No. of Pages : 3

[5265] - 2006

M.B.A.

204 : DECISION SCIENCE
(2016 Pattern) (Semester - II)

Dec 17

Time : 2¼ 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) Non Scientific calculator is allowed.

Q1) A project manager has 4 subordinates and 4 task. His estimate of the time that each would take to perform each task is given in the matrix below. How should be the task allocated, so that the total man hours are minimized. [10]

	I	II	III	IV
1	8	26	17	11
2	13	28	4	26
3	38	19	18	15
4	19	26	24	10

OR

Find the initial feasible solution for a given transportation matrix to reduce the cost using VAM method. [10]

	D ₁	D ₂	D ₃	D ₄	Supply
01	5	3	6	2	19
02	4	7	9	1	37
03	3	4	7	5	34
Demand	16	18	31	25	90

Q2) Solve the given LPP using graphical method to maximize $Z = 100x + 150y$,

Subject to, $2x + y \leq 30$,

$x + 3y \leq 45$

Where, $x \geq 0, y \geq 0$.

OR

[10]

P.T.O.

EXTERNAL

INTERNAL

SENIOR SUPERVISOR (EXAM.)

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Dec 17

A bakery keeps stock of branded cake. Daily demand based on the past experience and its probability is given below.

Demand	0	15	25	35	45	50
Probability	0.01	0.15	0.20	0.50	0.12	0.02

Consider the following sequence of random number - and
48, 78, 9, 51, 56, 77, 15, 14, 68 and 09.

- Simulate the demand for next 10 days.
- Find the Average demand of Cake.
- Find the stock situation of cake at the end of each day, if the owner of bakery decides to make 35 cakes every day. [10]

Q3) For the given profit matrix, find the optimal strategy using, [10]

- Max Mini criteria.
- Laplace criteria.
- Hurwicz criteria ($\alpha = 0.7$).

	N_1	N_2	N_3	N_4
S_1	30	10	10	8
S_2	40	-15	5	7
S_3	50	20	-6	10

OR

Solve the following game using dominance rule. [10]

		Player B				
Player A	Strategy	1	2	3	4	5
	I	1	3	2	7	4
	II	3	4	1	5	6
	III	6	5	7	6	5
	IV	2	0	6	3	1

Q4) We have 5 jobs each of which must go through the machines A, B & C. in the order ABC. Processing time in (hrs.) is as follows : [10]

Job	1	2	3	4	5
Machine A	5	8	6	9	5
Machine B	2	1	4	5	3
Machine C	3	7	5	6	7

Determine the sequence of the jobs that will minimize the total elapsed time. Also find the idle time for all machines as well.

OR
2

Dec 17

Write short notes on (any Two) :

[10]

- a) Concept of PERT and CPM.
- b) Concept of Network diagram with example.
- c) Dummy activities and events with example.
- d) Floats and its types with example.

Q5) A box contains 6 white and 8 red balls. The Second box contain 9 white and 10 red balls. One ball is drawn at random from the first box and put in the second box without noticing its colour. A ball is drawn at random from Second box. What is a probability that it is red? [10]

OR

In an intelligence test administered to 1000 students, the average score was 42 and the standard deviation 24. [10]

Find -

- a) The number of students lying between 30 and 54 marks.
- b) The value of score exceeded by top 100 students.

(Given Z at 0.5 = 0.1915, Z at 1.28 = 0.4).

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Total No. of Questions : 5]

P2210

SEAT No. : Pune - 52

[Total No. of Pages : 4

[5165]-2004

M.B.A. (Semester - II)

204 : DECISION SCIENCE

(2016 Pattern)

Time : 2¼ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Attempts (five) questions.
- 2) Each question has an internal option.
- 3) Each questions carry equal marks
- 4) Figures to the right indicate marks.
- 5) Graph will not be provided, draw diagram on answer sheet.
- 6) Non scientific calculator is allowed.

Q1) Solve the problem using VAM method and find optimum cost

[10]

	A	B	C	
X	4	8	8	76
Y	16	24	16	82
Z	8	16	24	77
	72	102	41	

OR

Find the least cost allocation for the following data

[10]

Typist	Job				
	P	Q	R	S	T
A	85	75	65	125	75
B	90	78	66	132	78
C	70	66	57	114	69
D	80	72	60	120	72
E	76	64	56	112	68

P.T.O.

May 17

Q2) A manufacturer produces two different models X & Y of the same product. Model X makes a contribution of Rs 50 per unit & model Y Rs. 30 per unit, towards total profit. Raw materials r_1 & r_2 are required for production. At least 18kgs of r_1 12kgs of r_2 must be used daily. Also atmost 34 hours of labour are to be utilized. A quantity of 2kgs of r_1 is needed for model X and 1kgs of r_1 for model y. For each of x & y, 1kg of r_2 is required. It takes 3 hours to manufacture model X and 2 hours to manufacture model y. [10]

Formulate the equations to maximize the profit.

OR

A company manufactures 30 units per day. The sale of these items depends upon demand which has the following distribution.

Sales (Units)	Probability
27	0.10
28	0.15
29	0.20
30	0.35
31	0.15
32	0.05

Using the following random number, estimate the total sales for next 10 days.

10, 99, 65, 99, 95, 01, 79, 11, 16, 20.

Q3) Number of reports produced [10]

Demand		S_1	S_2	S_3	S_4
No. of reports Perweek					
M_1		0	200	-400	-600
M_2		-250	300	100	-100
M_3		-250	50	600	400
M_4		-250	50	350	900

For the given profit matrix, find the optimal strategy using.

- Laplace criteria
- Hurwicz criteria ($\alpha = 0.6$)
- Maximax criteria

OR

Arrivals at a telephone booth are considered to be poisson. With an average time of 10 minutes between one arrival and the next. The length of a phone call is assumed to be distributed exponentially with mean of 3 minutes.

- What is the probability that person arriving at the booth will have to wait?
- Average time person spends in the system.

Q4) Draw an arrow diagram showing the following relationships.

[10]

Activity Immediate Predecessor

A	-
B	-
C	-
D	AB
E	B,C
F	A,B
G	C
H	D,E,F
I	D
J	G
K	G
L	H,J
M	K
N	I,L

OR

Determine the sequence of these jobs that will minimise the total elapsed time.

Job	1	2	3	4	5	6	7
Machine A	3	12	15	6	10	11	9
Machine B	8	10	10	6	12	1	3

May 17

Q5) Four cards are drawn at random from a pack of 52 cards. Find the probability that [10]

- a) All are clubs
- b) Two are kings and two are jacks.

OR

The weekly wages of 1000 workers are normally distributed around a mean of Rs 70/- and standard deviation of Rs 5/-. Estimate the number of workers whose weekly wages will be

- a) Between Rs 70/- and Rs 72/-
- b) Less than Rs 63/-

(Give Z at 0.4 = 0.1554, Z at 1.4 = 0.4192)

