

Total No. of Questions : 5]

SEAT No. :

P2210

[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.**

**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 10minutes between one arrival and the next. The length of a phone call is assumed to be distributed exponentially with mean of 3 minutes.

- i) What is the probability that person arriving at the booth will have to wait?
- ii) 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

**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)

