[Time: Three Hours]   **[Marks:100]**

Please check whether you have got the right question paper.

N.B: 1.   All Questions are compulsory.
           2.   Figures to the right indicate full mark allotted.
           3.   Use of simple non-programmable calculator is allowed.
           4.   Graph papers will be provided on request.

SECTION-I

Q.1   Attempt any FOUR of the following.

a)   Mihir sold some shares at a market price of Rs.300 per share with 0.1% brokerage. He got Rs.1, 13,886 in   **(5)**
     this transaction. Find the number of shares he sold.

b)   Chaitali got 320 shares of a company of face value Rs.10 at a market price of Rs.120 each. After 3 months   **(5)**
     she received dividend at 40%. After 6 months she sold the shares at a market price of Rs.160. She paid
     brokerage at 0.4% for both the transactions. Find the percentage profit.

c)   An investor joined a mutual fund with Rs.26, 176 when N.A.V. was Rs.80. When the N.A.V. touched   **(5)**
     Rs.100 he sold all his units. Find his gain in the entire deal if the entry load is 2.25% and the exit load is
     0.5%.

d)   If a mutual fund has N.A.V. of Rs.36 at the beginning and Rs.45 at the end of the year, find the absolute   **(5)**
     change and the percentage change during the year.

e)   On the instructions of Mr. Anant Gonsalvis, a mutual fund executed an S.I.P. and invested Rs.5000 each   **(5)**
     on the 8th of each month from January-2016 to April-2016. The N.A.V. s for these four days were
     Rs.37.34,
     Rs.37.56, Rs.37.66 and Rs.37.78 respectively. Find the average acquisition cost per unit up to 2 decimal
     places. (The number of units was rounded off up to 3 decimal places. There was no entry load.)

Q.2   Attempt any fOUR from the following.

a)   An organization consists of 9 members of which 4 are doctors. A selection of 4 persons is to be done   **(5)**
     amongst these members. Find how many selections will have i) no doctor ii) exactly 2 doctors.

b)   There boys and five girls are made to sit in a line for a music competition. How many different   **(5)**
     arrangements can be made so that no two boys are together?

c)   Solve the following linear programming problem by using graphical method :   **(5)**
     Maximize Z = 2x + 3y
     Subject to,
     x + y ≤ 6;
     3x + y ≤ 12;
     x ≥ 0; y ≥ 0.

d) A painter makes two paintings A and B. He spends 1 hour for drawing and 3 hours for coloring the painting A and he spends 3 hours for drawing and 1 hour for coloring the painting B. He can spend at most 8 hours and 9 hours for drawing and coloring respectively. The profit per painting of Type A is Rs.4000 and that of type B is Rs.5000. **(5)**
Formulate as Linear Programming Problem to maximize the profit.

e) Solve the Linear programming problem graphically: **(5)**
Minimize Z=25x + 10y
Subject to
$10x + 2y \geq 20$
$X + 2y \geq 6$
$x \geq 0, y \geq 0$

SECTION-II

Q.3   Attempt <u>any FOUR</u> of the following.

a) Calculate the Arithmetic Mean and Mode of Marks of students from the following frequency distribution. **(5)**

Marks	0-10	10-20	20-30	30-40	40-50
No. of students	7	12	15	10	5

b) Define the term Arithmetic Mean and State any two of its properties. **(5)**

c) Draw less than ogive curve for the following frequency distribution and hence locate the Median Graphically. **(5)**

Production in number of units	0-10	10-20	20-30	30-40	40-50
No. of days	12	16	24	15	13

d) The following data gives the Mean & Standard Deviation of wages of two groups of workers. **(5)**

	Group-I	Group-II
Number	50	100
Mean wages (Rs.)	120	85
Variance of Wages (Rs.)	9	16

In which group is there greater variation in the distribution of wages?

e) Find Quartile Deviation for the following data. **(5)**

Marks	0-10	10-20	20-30	30-40	40-50
No. of students	12	18	26	15	09

Q.4   Attempt <u>any FOUR</u> of the following.

a) Define the following terms with example. **(5)**
    I)   Sample Space
    II)   Exhaustive Events

b) Three coins are tossed, find the probability of getting **(5)**
    i)   All tails
    ii)   At most two tails

c) Find E(X) and V(X) for the following probability mass function of Random Variable X.

X	1	2	3	4
P (X = x)	0.2	0.3	0.4	0.1

d) If $P(A^C)$ = 2/3, P(B) = 1/4, P (AUB) = 5/12 Find P (A∩ B) and P(A/B). **(5)**

e) A ticket is drawn from 35 lottery tickets numbered from 1 to 35. Find the probability that the number on the ticket is divisible by 5 or 7.

Q.5   Attempt <u>any FOUR</u> of the following.

a) Construct Regret Table and find the best decision by Minimax Regret Criterion.

State of Nature	Course of Action		
	A_1	A_2	A_3
S_1	30	25	39
S_2	42	47	40

b) Given the following Pay-off table, find optimal decision using : **(5)**
   i) Laplace Criterion,
   ii) Maximax Criterion
   iii) Maximin Criterion

Demand	Course		
	C_1	C_2	C_3
Low	100	98	82
Medium	92	105	81
High	85	70	60

c) Draw a decision tree for the decision making problem and suggest the best action. **(5)**

State of Nature	Probability	Course of Action.	
		A_1	A_2
S_1	0.7	45	25
S_2	0.3	5	20

d) Find the best Action by using EOL criterion for the following pay-off matrix. **(5)**

State of Nature	Probability	Actions.	
		A_1	A_2
S_1	0.4	120	150
S_2	0.3	160	100
S_3	0.3	140	170

e) Find the best decision by using EMV criterion for the following pay-off matrix. **(5)**

State of Nature	Probability	Action		
		A_1	A_2	A_3
S1	0.5	20	30	10
S2	0.3	60	40	30
S3	0.2	30	70	40