Q.P. Code:00005259

[Time:3.00Hrs] **[Marks:100]**

Please check whether you have got the right question paper.

N.B: 1. All question are compulsory.
2. Figures to the right indicate full marks.
3. Use of non-programmable simple calculator is allowed.
4. Graph paper will be provided on demand of student.

Q.1 Attempt any **Four** of the following:

A) Shaym sold some shares at a market price of Rs. 120 each and paid 0.1% brokerage. He received a net amount of Rs. 47,952. Find the number of shares sold. 5

B) Yuvraj invested Rs. 80,000 in shares at market value Rs. 160 each with face value Rs. 100. If company declare 3 bonus shares for every 10 shares, after that he sold all shares at Rs. 140 each. Find his net gain in this transaction. 5

C) Mr. Pawar brought 200 shares of face value Rs. 10 each at the market price of Rs. 45 each. If company declare 28% dividend. Find total dividend and rate of return on investment. 5

D) Ramesh purchased some units in a open-end fund at Rs. 103.35 and its N.A.V. after 18 months was Rs. 108.45. Find the annualized change in N.A.V. as a percentage. 5

E) Mr. Patil invest 7000 p.m. in SIP of mutual fund for 3 months. The NAV are Rs. 54, 55, and 62 respectively. The fund was without entry load throughout. Find average cost price per unit. 5

Q.2 Attempt any **Four** of the following:

A) In how many ways can the letters of the word "FATHER" be arranged? How many of these words begin with T and end with E? How many of these begin with A? 5

B) A committee of 4 is to be selected from 5 boys and 6 girls. In how many ways can this be done so that (i). exactly one girl is included, (ii). At most one boy is in the committee? 5

C) A manufacturer of furniture makes two products: Chairs and tables. Processing of these products is done on two machines A and B. A chair requires 2 hours on machine A and 6 hours on machine B. A table requires 5 hours on machine A and no time on machine B. Time available per day on machine A and B are 16 and 30 hours respectively. Profits earned from a chair and a table are Rs.50 and Rs.250 respectively. Formulate the problem as standard LPP. 5

D) Solve the L.P.P. graphically. 5

Minimize $Z = 40x + 80y$ Subject to $3x + 2y \geq 18, x + 4y \geq 16,\ x,\ y \geq 0.$

E) Solve the L.P.P. graphically. 5

Maximize $Z = 10x + 15y$ subject to $3x + 4y \leq 12,\ x + 2y \leq 4,\ x, y \geq 0.$

Q.3 Attempt any **Four** of the following:

A) Write merit and demerits of mean deviation. 5

B) Draw a Histogram for the following data and find mode graphically 5

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of student	15	20	40	20	10	4

C) Calculate the mean for the following data: 5

Income in Rs.	2000-3000	3000-4000	4000-5000	5000-6000	6000-7000
No. of employees	16	35	60	24	13

D) The following data are available for two groups of workers in a factory. Which group is more consistent? 5

	Group I	Group II
Number of workers	60	90
Average daily wages (Rs.)	120	115
Standard deviation (Rs.)	7	8

E) Calculate the quartile deviation for the following distribution: 5

Daily profit (in Rs.)	200-400	400-600	600-800	800-1000	1000-1200
No. of shops	4	6	10	16	12

Q.4 Attempt any **Four** of the following:

A) Define the following with example: i) Probability of an event, ii) complement of event. 5

B) A box contains 25 tickets numbered 1 to 25. A ticket is drawn at random from the box. Find the probability that the number on the ticket drawn is i) divisible by 3, ii) not divisible by 5. 5

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C) If $(A \cup B) = \frac{5}{6}$, $P(\overline{A}) = \frac{1}{3}$, $P(B) = \frac{1}{2}$, find $P(\overline{B})$, $P(A \cap B)$. 5

D) The probability distribution of daily demand of cell phones in a mobile gallery is given below. Find the mean and variance. 5

Demand	5	10	15	20
Probability	0.4	0.2	0.3	0.1

E) The probability that A can shoot a target is $\frac{1}{5}$ and probability of B can shoot at the same target is $\frac{2}{5}$. A and B shot independently. Find the probability that (i) the target is not shot at all, (ii) the target is shot by at least one of them. 5

Q.5 Attempt any **Four** of the following:

A) Given the following pay-off table find optimal decision using criterion, (i).Maximin, (ii).Maximax. 5

Course of action	**States of nature**			
	S1	**S2**	**S3**	**S4**
A1	18	12	14	9
A2	15	14	11	11
A3	13	16	17	16

B) For the following pay-off table select the best decision using EOL Criteria. 5

Pay-off →	State of nature		
Acts ↓	S1	S2	S3
A1	80	60	110
A2	40	0	50
A3	100	-20	70
Probability	0.3	0.2	0.5

C) Find the best decision by using EMV criterion for the following pair of Matrix. 5

State of nature	**Decisions**			
	A1	**A2**	**A3**	**probability**
S1	20	30	10	0.5
S2	60	40	30	0.3
S3	30	70	40	0.2

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D) Find the optimal decision using decision tree approach. 5

State of nature Action	S1	S2	S3
A1	25	35	40
A2	50	20	10
Probability	0.3	0.5	0.2

E) Explain the element of a decision-making problem. 5