Q.P. Code : 30479

[Time: Three Hours] [Marks: 100]

Please check whether you have got the right question paper.

N.B:
1. All five questions are compulsory.
2. In each question, attempt any four sub-questions out of the given five sub-questions.
3. Use of a simple calculator is allowed.
4. Use of a scientific calculator, digital diary or a mobile phone is NOT allowed.
5. Graph paper will be provided on request.

Section I

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

A) Sukumar 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. **05**

B) Meenal invested Rs. 30,000 in 10% Rs. 50 shares which she purchased at 100% above par. Find the rate of return on investment. **05**

C) Hitesh invested Rs. 10,000 in a mutual fund on 20/04/2006 at an NAV of Rs. 23.38 and redeemed all the units on 20/10/2008 at an NAV of Rs. 44.26. The entry load was 2.25% and there was no exit load. Find the total gain. (The number of units was rounded off up to 2 decimal places). **05**

D) Pankaj invested Rs. 30,000 in a mutual fund when the NAV was Rs. 25.54 with an entry load of 2.25%. Calculate the no. of units (rounded off to 2 decimal places). Also find the current value of his investment if the current NAV is Rs. 28.32. **05**

E) Romani invested Rs. 5000 per month in an S.I.P for four consecutive months when the NAVs were Rs. 12.42, Rs. 13.87, Rs. 13.34, Rs. 12.88 respectively. Find the average acquisition cost per unit up to 2 decimal places. (The number of units was rounded off up to 2 decimal places). **05**

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

A) Maximize $Z = 6x + 7y$, subject to $2x + 3y \leq 12$, $2x + y \leq 8$, $x \geq 0$, $y \geq 0$. **05**

B) Minimize $Z = 13x + 15y$, subject to $3x + 4y \geq 360$, $2x + y \geq 100$, $x \geq 0$, $y \geq 0$. **05**

C) The daily requirement of Vitamin A and B per person is at least 5 units and 8 units respectively. Food I contains 1 units of Vitamin A and 2 units of Vitamin B respectively per serving. Food II contains 1 units of Vitamin A and 3 unit of Vitamin B respectively per serving. The cost of Food I and Food II is Rs. 50 and Rs. 60 per serving respectively. How many servings of Food I and Food II should be consumed per day so that the minimum daily requirement of the vitamins is fulfilled at a minimum cost? Formulate the above mathematically as a Linear Programming Problem. **05**

D) Seven directors have to be seated in a row on stage for a meeting of a company. Mr. Sharma has secretly indicated to the stage manager that he does not want be seated next to Mr. Verma under any circumstances. In how many ways can the directors be seated? **05**

E) There are 5 boys and 4 girls, from whom a committee of 3 boys and 2 girls is to be formed. Find the number of ways in which this can be done, if a particular boy is to be excluded. **05**

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Section II

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

A) For the following data calculate D_4 and P_{75}. **05**

Class Interval	0-10	10-20	20-30	30-40	40-50
Frequency	10	20	35	15	20

B) Find standard deviation & coefficient of variation from the following data. **05**
$n = 15, \Sigma x = 600, \Sigma(x - \bar{x})^2 = 240$

C) Calculate mean deviation from Median for the following data **05**
Marks: 61, 52, 40, 47, 62, 61, 56

D) Calculate Arithmetic Mean & Mode from the following data **05**

Size of the shirts (in cms)	36	38	40	42	44
No. of shirts in stock	5	15	30	20	10

E) Explain the meaning of dispersion. What are the important measure of dispersion? **05**

Q4 Attempt **any four** of the following:

A) If $P(X = 2) = 0.3$, $P(X = 3) = 0.4$, $P(X = 4) = 0.3$ find the variance of Random Variable X. **05**

B) A man and his wife appear for an interview for two posts. The probability of husband's selection is 1/7 and that of the wife's selection is 1/5. What is the probability that only one of them will be selected? (Assume Independence) **05**

C) If $P(A) = \frac{2}{5}$, $P(B) = \frac{1}{3}$ and $P(A \cup B) = \frac{1}{2}$, find $P(\frac{A}{B})$ and $P(\frac{B}{A})$. **05**

D) One ticket is drawn at random from a set of 20 tickets numbered from 1 to 20. What is the probability that number of the tickets drawn is divisible by 2 or 3? **05**

E) Write down the classical definition of Probability. State the limits within which the probability of any event lies. Why? **05**

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

A) For the following pay-off table find the optimal decising using maximin and Laplace criterion. **05**

Course of Action	State of nature	
	S1	S2
A1	25	85
A2	40	0
A3	65	30

B) The following is demand distribution of a certain product. **05**

No. units demanded	10	11	12
Probability	0.35	0.40	0.25

The product is sold at Rs. 100 per unit with cost of Rs. 70. Construct pay-off table.

C) Find the optimal decision using decision tree approach **05**

Pay-of table

Action	State of Nature		
	S1	S2	S3
A1	250	350	400
A2	500	200	100
Probability	0.3	0.5	0.2

D) For the pay-off matrix given below, find best course of action using EOL criterian. **05**

State of Nature	Actions		Probability
	A1	A2	
S1	50	-20	0.1
S2	800	880	0.7
S3	1300	1480	0.2

E) Explain the following criterion in decision making **05**

(a) Maximin (b) Minimax regret.

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