Q.P. Code : 787200

(2½ Hours)   **[Total Marks :75**

N.B. : (1) **All** questions are **compulsory** carrying 15 marks each
    (2) **Figures** to the right **indicate** full marks of **each subquestion.**
    (3) **Graph** to be **provided** wherever **needed.**

1. **(A)** Choose the correct answer : (any **eight**)

    (1) Mode of the data 1,2,2,2,3,3 is ------------
        (a) 1   (b) 2
        (c) 3   (d) none of these

    (2) To calculate rank correlation coefficient, we find ------------ between the ranks.
        (a) sum   (b) product
        (c) difference   (d) none of thee

    (3) ----------- is a measure of dispersion.
        (a) Mean   (b) Mode
        (c) Standard deviation   (d) none of these

    (4) ------------ can be located with the help of a histogram.
        (a) Mode   (b) Mean
        (c) Decile   (d) None of these

    (5) If F denotes Fisher's index number, L denotes Laspeyre's index number, and P denotes Paasche's index number, then F = ----------
        (a) $L+P$ (b) $L-P$
        (c) $L \times P$ (d) $\sqrt{L \times P}$

    (6) For the data: 8,1,4.5,9,3,2,7 range is --------------
        (a) 6   (b) 8
        (c) 4   (d) 7

    (7) For calculating ------------- , we use a regret table.
        (a) minimax   (b) percentage
        (c) average   (d) none of these

    (8) Deciles divide the data into --------------- equal parts.
        (a) 15   (b) 10
        (c) 5   (d) none of these

    (9) EOL stands for Expected --------------- Loss.
        (a) Opportunity   (b) Objective
        (c) Occupancy   (d) none of these

(10) Time given extra after the due date of premium is known as ----.
   (a) Maturity Period   (b) Grace
   (c) Lapse   (d) none of these

1. (B) State **true or false**. (any **Seven**)   7
   (1) Insurance premiums can be paid monthly.
   (2) Class-mark of the interval 10-20 is 15.
   (3) Quartiles divide the data into 2 equal parts.
   (4) EMV stands for Expected Monetary Value.
   (5) Arithmetic mean of 4 and 6 is 7.
   (6) Index number for the base year is always zero.
   (7) Coefficient of correlation lies between -1 and +1.
   (8) b_{yx} and b_{xy} are called regression coefficients.
   (9) Probability of an event can be negative.
   (10) Mean deviation can be obtained from arithmetic mean.

2. Solve :

   (A) Draw histogram and frequency polygon for the following data :   8

Marks	10-20	20-30	30-40	40-50	50-60
No. of students	05	15	25	10	05

   (B) For the following data, find mean, median and mode: 7

x	1	2	4	6	7
f	4	5	3	1	2

OR   10

2. (C) Find D_3 and P_{20} for the following data :

Age in years	0-5	5-10	10-15	15-20	20-25
No.of persons	07	18	25	30	20

2. **(D)** Find class-width, less than cumulative frequency, and greater than cumulative frequency from the following data : **5**

Class - interval	50-60	60-70	70-80	80-90	90-100
Frequency	07	12	15	08	04

3. **Solve :** **10**

   (A) Calculate standard deviation for the following data :

Class - interval	0-10	10-20	20-30	30-40	40-50
Frequency	02	03	07	05	03

   (B) A factory produces two types of bulbs A and B. The average life and standard deviation for the two types are given below. Which type is more uniform? **5**

$$\overline{X}_A = 1100, \overline{X}_B = 840, \sigma_A = 220, \sigma_B = 210$$

OR

3. **(C)** Average prices of rice and wheat per quintal for 5 years are given below. Find coefficient of correlation. **8**

Price of Rice (100 Rs.)	15	18	20	19	23
Price of Wheat (100 Rs.)	10	10	11	12	12

   (D) For the following data, find the two regression equations : **7**

$$\overline{x} = 4, \overline{y} = 80, \sigma_x = 0.5, \sigma_y = 7, r = 0.55$$

4. **Solve :** 10

(A) For the following data, find Laspeyre's, Paasche's, and Fisher's index numbers :

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	8	20	10	22
B	9	15	10	20
C	7	18	11	15
D	10	6	15	6

5

(B) A random variable x has the following distribution :

x	0	1	2	3	4	5
p(x)	0.04	0.20	0.40	0.20	0.12	0.04

Find $E(x)$ and $V(x)$.

OR

8

4. (C) For the following pay-off table, suggest best action using (i) maximin (ii) maximax (iii) minimax regret criterion.

States of Nature	Acts			
	A_1	A_2	A_3	A_4
S_1	14	02	09	08
S_2	09	10	11	13
S_3	10	08	11	11
S_4	06	07	10	12

7

(D) Mr. Sameer Raza has taken an insurance policy of Rs.1,00,000/- for which the tabulated annual premium rate is Rs.66.80 per thousand. The company adds extra Rs.5/- for half-yearly mode of payment. The company also offers a reduction of Rs.2/- in the premium per Rs.1,000/- sum assured, when the sum assured is Rs.50,000/- or more. Find the half-yearly premium amount.

TURN OVER

5.   **Answer the following :**

(A)   State the properties of Normal Distribution.   8

(B)   Explain 'policy lapse' and 'paid-up value' in insurance.   7

<div align="center">**OR**</div>

5. (C)   Write short notes on: (any **three**)   15
      1. Properties of Arithmetic Mean
      2. Index Number of Wholesale Prices
      3. Merits of Median
      4. Properties of Correlation Coefficient
      5. Merits and Demerits of Range

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