

B1Q1222

Time: 2 ½ hrs.

Marks: 75

- Note: 1. All questions are compulsory.
2. Figures to the right indicate full mark.
3. Graph papers will be provided on request.
4. Use of normal calculator is allowed.

Q.1 (A) Fill in the blanks with the correct alternative (any eight):

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1. Quartile Deviation is calculated using: _____
a. Q1 and Q2 b. Q2 and Q3 c. Q1 and Q3 d. All quartiles
2. Value of Standard Deviation is always _____
a. Negative b. Non-negative c. positive d. Cannot say
3. The median of 10, 15, 17, 7, 19, 12, 9
a. 12 b. 10 c. 11 d. 13.5
4. Regression coefficient lies in between : _____
a. 0 and 1 b. -1 and 0 c. -1 and +1 d. $-\infty$ and $+\infty$
5. The length of the interval 45-65 is _____
a. 20 b. -20 c. 55 d. 50
6. Median is the _____ value.
a. Middle b. Smallest c. Most Frequent d. Least Frequent
7. To find the Median graphically, we plot _____
a. Histogram b. Bar Graph c. Pie diagram d. Ogive Curve
8. Variance is the _____ of the Standard Deviation.
a. Square Root b. Square c. Reciprocal d. Cuberoot
9. If events A and B are mutually exclusive then $P(A \cap B) =$ _____
a. 0 b. 1 c. ∞ d. $P(A \cup B)$
10. Limits of Probability : _____
a. 0 and 1 b. -1 and 0 c. -1 and +1 d. $-\infty$ and $+\infty$

B. State whether the following statements are true or false (any seven):

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1. Coefficient of variation is always calculated in %.
2. Mean Deviation can be calculated only from median.
3. Mode can be located graphically using Histogram.
4. Secondary data can be collected from various magazines, internet, report, etc.
5. Median is one of the measures of dispersion.
6. Deciles divide the data into 10 equal parts.

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7. Range is the difference between maximum and minimum values.
8. Median is not based on all the observations.
9. Deciles divide the data into 100 equal parts.
10. There are 100 percentiles which divide the data into 100 equal parts.

- Q.2 A.** Draw a Less than Ogive curve and locate median on it for the data given below: 10

Age in years	10-12	12-14	14-16	16-18	18-20	20-22
No. of boys	5	9	15	17	10	4

- B.** A housewife buys a dozen eggs of which two are bad. She chooses 4 eggs to scramble for breakfast. Find the probability that she chooses i) all good eggs ii) three good and 1 bad eggs iii) 2 good and 2 bad eggs iv) at least 1 bad egg. 05

OR

- C.** Calculate Q_3 , D_2 , P_{25} , and P_{75} for the data below:- 10

C.I.	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	15	10	25	30	10	10

- D.** If X is a random variable having probability function : 05

$$P(X=x) = x/8, \quad x=0,1$$

$$=k/4, \quad x=2$$

$$=kx/16, \quad x=3$$

Find k and $E(x)$.

- Q.3 A.** Calculate the Rank Correlation between X and Y . 08

X	13	15	14	16	10	12
Y	12	6	8	3	20	16

- B.** Calculate Mean Deviation from Median for the data below:. 07

X	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	6	18	30	24	9	5

OR

- C.** Draw Histogram and locate Mode on it. 08

Height in cm	110-120	120-130	130-140	140-150	150-160	160-170	170-180
No. of Children	8	10	20	25	15	12	10

D. Given the following conditional cost matrix corresponding to 3 Acts A1, A2 and A3 and 3 states of nature. Find the best action to minimize cost using EOL criterion.

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State of Nature	Conditional Cost(Rs.)			Probability
	A1	A2	A3	
S1	0	1500	3000	0.80
S2	9000	1500	3000	0.15
S3	18000	10500	3000	0.05

Q.4 A. Calculate index number using weighted average of relative method.

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Commodities	Price		Quantity 2017
	2017	2018	
A	2	4	2
B	3	5	5
C	10	15	10

B. Find the Regression equation of X on Y from the data below:

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X	3	5	8	10	14
Y	9	14	20	27	40

OR

C. Find the Coefficient of Correlation, given the following data:

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i) $\sum x = 96$, $\sum y = 84$, $\sum x^2 = 1128$, $\sum y^2 = 1380$, $\sum xy = 312$, $n = 12$

ii) $\sum x = 20$, $\sum y = 11.58$, $\sum x^2 = 90$, $\sum y^2 = 27.03$, $\sum xy = 47.13$, $n = 5$

D. Mr. Kunal Goswami has a savings policy for 20 years term for a sum assured of Rs. 10,00,000. Of the 20 annual premiums, 8 have been paid already. There is a vested bonus of Rs. 1,00,000. After this, he could not pay the remaining premiums and the policy was converted to a paid-up policy. Find the paid-up value.

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Q.5 A. What is Correlation Coefficient? Also explain positive and perfect correlation.

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B. Explain how to plot median graphically.

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OR

C. Write short notes (any 3)

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a. Scatter Diagram

b. Measures of Dispersion.

c. Properties of Normal Distribution.

d. Decision Theory

e. Merits and demerits of Mode.