N. B. :
1) Each question carries equal marks.
2) Figures to the right indecate full marks.
3) Calculators are allowed.
4) Use of statistical tabies and log tables is allowed.

Q.1a)   Find the missing frequency given that the average marks are 66.5   5

Marks	No.of students
10-20	1
20-30	2
30-40	3
40-50	5
50-60	7
60-70	-
70-80	16
80-90	10
90-100	4

b)   Draw 'greater than ogive' and 'less than ogive' for the following data.   4

Weight in Kg.	No.of students
35-40	4
40-45	8
45-50	10
50-55	12
55-60	6
60-65	2

c)   Find quarties Q_1, Q_3 and Q_2 for the data in Q.1 (b)   6

OR

Q.1a)   The following data gives montly salaries of 30 employees of a certain factory.

1250	1300	1325	1505	1600	2000
2050	1200	1425	1450	1525	1500
2500	2520	1425	1350	1330	1420
1350	1280	1450	2250	2160	1260
1420	1580	1650	1800	1820	1900

(i)   Prepare frequency distribution of above data taking class intervals 1200-1500,

1500 - 1800, etc.   5

(ii)   Draw Histogram for above data.

b)   Define (i) Variance for grouped data.   5

(ii) Range.

(iii) Coefficient of mean deviation about 'a'

Define minimal property of mean deviation.

c)   Give merits and demerits of   5

(i) Arithmatic mean.

Q.2a) Find standard deviation and variance for following data:-   **6**

xi	fi
15	4
20	10
25	12
30	13
35	3

b) Define Karl-Pearson's correlation coefficient of two variables x and y
Calculate Karl-Pearson's correlation coefficient for the following data.

x :	12	8	9	9	10	15
y :	6	4	2	11	3	3

     6

c) Define   **3**
(i) Scatter diagram
(ii) Sample space
(iii) Certain event

OR

Q.2 a) There are two groups one containing 100 students and the other containing 50 students respectively. The mean marks at the first group in Economics are 60 and the mean marks of the second group are 90. The standard deviations of the two groups are 6 and 8 respectively. Find the combined mean and standard deviation at all 150 students taken together.   **4**

b) Tickets numbered from 1 to 30 are well-shuffled and a ticket is drawn from them. What is the probability that the ticket drwan has -   **5**
(i) an odd number.
(ii) multiple of 8.
(iii) number divisible by 3 and 4.

c)   **6**

Reduction in weight	No.of patients (in kg)
0-2	5
2-4	5
4-6	20
6-8	15
8-10	5

Calculate (i) Variance.
           (ii) Arithmatic mean for the above data.

Q.3a) **Write a note on skewness:**   **5**
If $Q_1 = 8.5$, $Q_2 = 12.5$ & $Q_3 = 21.30$.
Find (i) Bowley's relative measure at skewness.

b) **Define Geometric mean:**
Find geometric mean of 78, 100,150.   **4**

c) Write a mathematical definition of probability. If two dice are thrown simultaneously. What is the probability of -

(i) the sum of the points on both the dice is 9.

(ii) the sum of the points on both the dice is 12. 6

OR

Q.3a) **Write a note Kurtosis.** 5

If $Q_1 = 7$, $Q_2 = 6.2$ & $Q_3 = 18.75$.

Find absolute measure of skewness.

b) Define 'Harmonic mean'. 4

A train covers a distance of 300 km at the rate of 180 km/hr and returns with

the speed of 150 km/hr. What is the average speed of the journey?

c) There are 4 economists, 4 engineers and 3 statisticians and 1 doctor. 6

Committee of 4 from among them is to be formed. Find the probability

that the committee.

(i) contain exactly 2 economists and 2 engineers.

(ii) has the doctor as a member and three others.

(iii) has at least one statistician.

Q.4a) Marks of 25 students in Mathematics (x) and statistics (y) are given below 6

(30,40), (32,32), (35,40), (40,40),

(20-25), (25-30), (30,30), (42,48),

(42,48), (32,33), (33,38), (34,36),

(36,48), (30,30), (25,28), (22,30),

(42,38), (32,34), (34,38), (36,36),

(40,40), (46,22), (28,34), (35,32),

(34,40).

(i) Prepare bivatiate frequency table for the above data with class intervals

20-25, 25-30, 30-35, --------, etc. for both x & y.

(ii) Write marginal distributions of x and y.

(iii) Conditional distribution of x when y is between 35-40.

b) Calculate mean deviation about 150 for the following data - 4

Height (in cm)	150	153	154	160	162
No.of persons (fi)	4	8	9	15	6

c) Define (i) Independent events. 5
(ii) Mutually exclusive events.
A card is drawn from a full pack of 52 well-shuffled cards. Find the probability of
(i) Getting ace card.
(ii) Getting club or king.

OR

Q.4a) What is regression? 5
For a certain bivariate data,
$\partial_x = 4$, $\partial_y = 10$
Correlation coefficient r = 0.85
$\bar{x} = 56$, $\bar{y} = 68$.
Find (i) two regression coefficients bxy & by x.
(ii) line of regression of Y on X.

b) In a sample survey of veg. and non-veg. habits of two towns A and B, 5
following information was received -

Town A :- Females were 40%. Total vegeterians are 45% and male non-vegeterians are 20%.

Town B :- Males were 55%, Male non-vegeterians were 40% and female vegeterians were 20%. Represent the above data in a tabular form.
(Assume total population of each town equal to 100).

c) **Fill in the blanks :**
5
(i) If mean, mode, median are equal for a distribution, the distribution is _____.
(ii) Maximum value of probability is _____.
(iii) Below lower quartile Q_1, there are _____ % of the observations.
(iv) A distribution having coefficient of skewness equal to - 1.2 is _____ skewed.
(v) If correlation coefficient between two variables X and Y is zero implies that the two varitables are _____.

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