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BC-2875

B.C.A. (Third Semester)

EXAMINATION, 2024-25

ELEMENTS OF STATISTICS

Time : Two Hours

Maximum Marks : 75

Note : Attempt questions from all Sections as directed.

Section—A

(Very Short Answer Type Questions)

Note : Attempt any *five* questions. Each question carries 7 marks. 5×7=35

1. Define positional average with example.
2. What do you understand by classification ? Also explain the types of classification.

P. T. O.

3. Calculate the median from the data given below :

128, 45, 75, 89, 82, 65, 27

27 45 65 75 82 89 128

4. Write the name of best measure of dispersion. Why ?

5. An electric network contains 14 switches such that each switch may have three possible positions. How many different switchings are there ?

6. From 4 men and 6 women, find the number of committees of 3 that can be formed with 2 men and 1 woman.

7. A and B throw 2 dice simultaneously. If A throws a total of 9, find B's chance of throwing a higher number.

8. Define range and its uses in real life situation.

9. Discuss the limitations of statistical quality control.

10. If :

then

Note

1.

10. If :

Dist.	N	Mean
A	20	60
B	50	50
C	60	40

then find combined mean.

Section—B

(Short Answer Type Questions)

Note : Attempt any *two* questions. Each question carries 10 marks. 2×10=20

1. A sample of 5 items was taken from the output of a factory. The length and weight of 5 items are given below :

Length (inches)	5	6	7	9	12
Weight (ounces)	13	15	18	19	20

State which of the two characteristics of the two items is more variable.

2. (a) Explain the following with example :
   (i) Mutually exclusive event
   (ii) Independent events

(b) Prove that :

$$^{8}P_5 = 8\ ^{7}P_4$$

3. The expenditure of 100 families are given by :

Expenses (in ₹)	No. of Families
0—10	14
10—20	?
20—30	27
30—40	?
40—50	15

The mode for the distribution is 24. Find the missing frequencies.

4. In the production of certain rods, a process is said to be in control if the outside diameters have a mean 2.5" and a standard deviation of 0.002".

(i) Find the control limits for the mean of random samples of size 4.

(ii) Mean of 10 random samples taken at regular interval 2·5014, 2·5022, 2·4995, 2·5076, 2·504, 2·4993, 2·4962, 2·4966 and 2·4971, was the process even out of control ?

Section—C

(Long Answer Type Questions)

Note : Attempt any *one* question. Each question carries 20 marks. 1×20=20

1. Explain the measure of dispersion in detail.
2. Define median and calculate the median from the data given below :

Marks (below)	No. of Students
10	15
20	35
30	60
40	84
50	96
60	127
70	198
80	250

3. (a) Explain control chart for fraction defective.
   (b) Explain control chart for number of defects.

4. (a) Explain Harmonic Mean with example.

(b) Define conditional probability.

(c) Let A and B events with $P(A) = \frac{3}{8}$, $P(B) = \frac{1}{2}$, and $P(A \cap B) = \frac{1}{4}$, then find $P(A \cup B)$.