

Roll No. :

BCA-3005

BCA (Semester-III) (NEP) Examination, 2025-26

ELEMENTS OF STATISTICS

[Paper : Fifth]

Time : 2 Hours]

[Maximum Marks : 75

Note : 1. Attempt questions from **all** sections as directed.

2. The candidates are required to answer only in serial order. If there are many parts of a question, answer them in continuation.

3. "B" copy will not be provided.

Section-A

Short Answer Type Questions

Note : There are **nine** questions in this section. Attempt **all** questions. Each question carries **5** marks. [$9 \times 5 = 45$]

1. (a) Write about difference between primary and secondary data.
- (b) Mean of 100 items is found to be 30. If at the time of calculation, two items are wrongly taken as 42 and 22 instead of 33 and 21, find the correct mean.

- (c) Find the harmonic mean of 12, 8, 6 and 24.
- (d) What do you mean by measures of dispersion?
- (e) Find range and its coefficient of the following data :

Size	5	7	9	11	13	15
Frequency	1	5	3	9	4	2

- (f) In how many ways can the letters of the word 'FATHER' be arranged so that H is always next to T.
- (g) A bag contains 4 white, 3 red and 5 black balls. Find the chance the two balls are drawn at random are all white.

- (h) Define conditional probability with suitable example.
- (i) A machine drills hole in a pipe with a mean diameter of 0.532 cm and a standard deviation of 0.002 cm. Calculate the control limits for mean of samples 9.

Section-B

Long Answer Type Questions

Note : There are **four** questions in this section. Attempt **any one** question. Each question carries **15** marks.

[1×15=15]

2. Find less than and more than cumulative frequencies and draw 'Ogives' from the following data :

Class-Interval	Frequency
20 - 29	4
30 - 39	6
40 - 49	13
50 - 59	25
60 - 69	32
70 - 79	19
80 - 89	8
90 - 99	3

3. Find mean and median from the following distribution:

Income	No. of Persons
100 - 200	15
100 - 300	33
100 - 400	63
100 - 500	83
100 - 600	100

4. Calculate standard deviation and coefficient of variation from the following data :

x	f
0 - 50	12
50 - 100	15
100 - 150	10
150 - 200	20
200 - 250	9
250 - 300	9

5. Compute Quartile deviation and its coefficient from the following data :

Marks	No. of Students
10 - 20	8
20 - 30	6
30 - 40	18
40 - 50	27
50 - 60	15
60 - 70	9
70 - 80	14

Section-C

Long Answer Type Questions

Note : There are **four** questions in this section. Attempt **any one** question. Each question carries **15** marks.

[1×15=15]

6. (a) There are 5 men and 4 women to dine at a round table. In how many ways can they seat themselves so that no two women are adjacent?
- (b) Out of 6 teachers and 8 students, a committee of 11 is to be formed. In how many ways this be done, if the committee contains at least 4 teachers?

7. (a) A pair of dice is tossed twice find the probability of scoring 7 points at least once.
- (b) A bag contains 4 white and 6 red balls. Two draws of one balls each are made without replacement. What is the probability that one is red and other white?
8. The data shows the sample mean and range for 10 samples for size 5 each. Find the control limits for mean chart and range chart.

Sample	Mean	Range
1	21	5
2	26	6
3	23	9
4	18	7
5	19	4
6	15	6
7	14	8
8	20	9
9	16	4
10	10	7

Conversion factors for $n = 5$ are $A_2 = 0.483$, $D_3 = 0$, $D_4 = 2.004$)

9. 10 samples (each of size 100) of a component were inspected. The results of the inspection are given below :

Sample No.	No.of Defections
1	2
2	0
3	4
4	3
5	1
6	2
7	3
8	1
9	1
10	2

Draw the relevant control chart taking 3 sigma limits.

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