

**BCA-305 (N)**

**B.C.A. (Third Semester)  
EXAMINATION, MARCH-2021  
(New Course)  
Paper Fifth  
ELEMENTS OF STATISTICS**

*Time : Three Hours ]*

*[ Maximum Marks : 75*

**Note:** Attempt questions from all Sections as directed.

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

**Section-A**

(Short Answer Type Questions)

**Note:** Attempt all questions. Each question carries 3 marks.

- I
- (A) What do you mean by cumulative frequency distribution.
  - (B) Discuss the importance of classification in statistics.
  - (C) The mean of 200 items was 50. Later on it was discovered that two items were

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[2] ~~ANS~~

misread as 92 and 8 instead of 192 and 88. Find out the correct mean.

- (D) Find the geometric mean of 4, 8, 16.
- (E) The smallest value in a set of observations is 10 with a range of 25. Find the largest observation and the co-efficient of range.
- (F) Find  $n$ , if:  
$$\frac{n+1}{2} = 12 \times \frac{n-1}{2}$$
- (G) Find the number of permutations of the letters of the word 'EXAMINATION'?
- (H) A bag contains tickets numbered from 1 to 25. Two tickets are drawn. Find probability that both the numbers are prime.
- (I) Write a short note of statistical quality control.

### Section-B

(Long Answer Type Questions)

Note: Attempt any Two questions. Each question carries 12 marks.

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

Class	Frequency
0-9	5
10-19	15
20-29	18
30-39	30
40-49	15
50-59	10
60-69	5
70-79	2

3. Find median and mode from the following distribution:

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

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

Marks	No. of Students
0-10	10
10-20	15
20-30	25
30-40	30
40-50	15
50-60	10
60-70	5

5. Calculate mean deviation from median and its coefficient from the following data:

Size	Frequency
0-10	4
10-20	8
20-30	11
30-40	15
40-50	11
50-60	7
60-70	4

**Section-C**  
(Long Answer type Questions)

Note: Attempt any Two questions. Each question carries 12 marks.

6. (a) In how many ways can 10 books be arranged on a shelf so that a particular pair of books shall be:
- (i) Always together
  - (ii) Never together
- (b) If  $1 \leq r \leq n$ , prove that  
$$c(n, r) + c(n, r+1) = c(n+1, r+1)$$
7. (a) A husband and wife appear in an interview for two vacancies in the same post. The probability of husband's selection is  $1/7$  and that of wife's selection is  $1/5$ . What is the probability that <https://www.csjmuonline.com>
- (i) Both of them will be selected
  - (ii) Only one of them will be selected
- (b) A bag contains 4 white and 2 black balls and a second bag contains 3 of each colour. A bag is selected at random, and a ball is drawn at random from the bag chosen. What is the probability that the ball drawn is white?
8. The following table gives the result of inspection of 15 samples of 100 items each taken on working days. Draw an n.p. chart:

[6] marks

Sample No.	No. of Defectives
1	9
2	17
3	8
4	7
5	12
6	5
7	11
8	16
9	14
10	15
11	10
12	6
13	7
14	8
15	5

9. The following data shows the value of samples mean  $\bar{X}$  and range R for 10 samples of size 5 each. Calculate the values for control line and control limits for mean chart and range chart and determine whether the process is under control.

Sample No.	Mean ( $\bar{X}$ )	Range (R)
1	15	7
2	17	7
3	15	4
4	18	9
5	17	8
6	14	7
7	18	12
8	15	4
9	17	11
10	16	5

Give for  $n=5, A_2=0.577, D_3=0, D_4=2.115$

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