E–3913

B. C. A. (Part III) EXAMINATION, 2021

(New Course)

Paper First

STATISTICAL ANALYSIS

(301)

Time : Three Hours]   [*Maximum Marks : 80*

Note : Attempt any *two* parts from each Unit. All questions carry equal marks. Only simple calculators are allowed not scientific calculator.

Unit—I

1. (a) If $2 \cdot {}^{n}C_5 = 9 \cdot {}^{n-2}C_5$, then find the value of n.

   (b) Find the middle term in the expansion of :

   $$\left(x - \frac{1}{x} \right)^{10}.$$

   (c) Find the coefficient of x^7 in the expansion of :

   $$\left[x^2 + \frac{1}{x} \right]^{11}.$$

Unit—II

2. (a) Define Histogram and draw a histogram for the following distribution :

Class	Frequency
0—10	2
10—20	4
20—30	10
30—40	4
40—50	8

(b) Find the mean deviation from the arithmetic mean of the following distribution :

Marks	No. of Students
0—10	5
10—20	8
20—30	15
30—40	16
40—50	6

(c) Calculate Karl Pearson's coefficient of skewness from the following data :

Age (in years)	No. of Children
0—1	15
1—2	17
2—3	19
3—4	27
4—5	19
5—6	12

Unit—III

3. (a) What is the chance of throwing a total of 11 with two dice if the digit on first dice is 5 ?

   (b) In case of Binomial distribution, write an expression for the probability of at most *r* successes.

   (c) State and prove additive law of probability.

Unit—IV

4. (a) Find Karl Pearson's coefficient of correlation between the heights of fathers and sons (in inches) :

Height of Father	Height of Son
65	67
66	68
67	65
67	68
68	72
69	72
70	69
72	71

   (b) Fit a straight line to the following data regarding *x* as the independent variable :

x	*y*
0	1.0
1	1.8
2	3.3
3	4.5
4	6.3

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(c) Define Chi-square and discuss its uses in testing of hypothesis.

Unit—V

5. (a) What is sampling ? What are the main objects of sampling ?

(b) A random sample of 400 flower stems has an average length of 10 cm. Can this be regarded as a sample from a large population with mean of 10.2 cm and a standard deviation of 2.25 cm ?

(c) Prices of shares of a company on the different days in a month were found to be :

66, 65, 69, 70, 69, 71, 70, 63, 64 and 68.

Discuss whether the mean price of shares in the month is 65.