BACHELOR OF COMPUTER APPLICATIONS (BCA) (REVISED)
Term-End Examination
June, 2024

BCS–040 : STATISTICAL TECHNIQUES

Time : 2 Hours   *Maximum Marks : 50*

Note : *(i)* *Attempt both Sections i.e. Section A and Section B.*

(ii) *Attempt any* ***four*** *questions from Section A.*

(iii) *Attempt any* ***three*** *questions from Section B.*

(iv) *Use of non-scientific calculator is allowed.*

Section—A

1. The life of 20 electric bulbs (in hours) are given as follows :

125	160	175	170	111
101	165	150	140	130
120	135	145	155	165
145	105	157	167	153

(a) Construct a continuous frequency distribution of the data by taking class width 10.   3

(b) Draw the histogram of the distribution in given above.   2

2. The marks of four students in BCS-040 examination are given below :

Name	Marks
Amit	40
Preeti	26
Aman	30
Seema	32

Write down all possible samples of size 2 (without replacement) which can be drawn from the above data and show that sample mean (mean of all sample means) is equal to the population mean.   5

3. State additive law of probability. There are 300 patients in a certain hospital of which 15 are COVID-19 patients, 13 are typhoid patients while 3 are suffering from both. If a patient is selected at random from the hospital, what is the probability that he/she either COVID-19 or typhoid patient ? 5

4. The mean weekly sales of chocolate packets in different departmental stores was 146 packets per store. After an advertisement campaign the mean weekly sales of 16 stores for a typical week was 150 and showed a standard deviation of 10. Was the advertisement campaign successful at 5% level of significance ?

(Given $t_{(15), 0.05} = 1.753$). 5

5. Define time series with example and write its components. 5

P. T. O.

6. Write short notes on any *two* of the following :

$$2\tfrac{1}{2}+2\tfrac{1}{2}$$

   (i)   Stratified random sampling

   (ii) Correlation

   (iii) Median and Standard deviation

Section—B

7. In an experiment to study whether city smoke affects health, the following data was collected. Use Chi-square test to test the hypothesis that city smoke has effect on health, at 5% level of significance :   10

	Inhale City Smoke		
	Light	Moderate	Heavy
Health affected	17	31	36
Health not affected	38	24	19

(Given $\chi^2_{(2),0.05}$ = 5.99).

8. A company has the following cost and sales data : 10

Cost (in ₹ '000)	Sales (in ₹ '000)
10	15
12	16
13	16
11	15
9	10
11	14
12	14
10	12

(i) Construct a scatter plot for the given data.

(ii) Find the best linear regression line assuming that cost is an independent variable and sales is a dependent variable.

(iii) Predict sale when cost is ₹ 15,000.

9. Describe systematic sampling. The information regarding production of wheat (in thousand kg) in 25 districts is collected for a particular

season. Select a possible systematic random sample of 7 units from the data given as follows :

10

23, 20, 30, 37, 76, 36, 13, 36, 16, 58, 53, 83, 10, 15, 13, 17, 12, 16, 17, 21, 18, 61, 31, 71, 20

Also calculate the sample mean from the selected units.

10. Write short notes on any *two* of the following :

5+5

(i) $\bar{X}$ -control chart

(ii)   Goodness of fit test

(iii) Poisson distribution

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