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BCS-040

BACHELOR OF COMPUTER APPLICATION (BCA) (Revised)

Term-End Examination

BCS-040 : STATISTICAL TECHNIQUES

Time : 2 Hours] *[Maximum Marks : 50*

Note: Attempt both Sections i.e. Section-A and Section-B. Attempt any four questions from Section-A. Attempt any three questions from Section-B. Use of non-scientific calculator is allowed.

Section-A

1. Given the following sample of 20 numbers: 5

12, 41, 48, 58, 14, 43, 50, 59, 15, 45, 52, 72, 18, 45, 54, 78, 41, 47, 56, 79

(i) Compute mean, variance and standard deviation.

(ii) If the largest value in the sample of 20 number given above, is changed to 500, then to what extent the mean and variance will change? Justify your answer.

2. A dice is rolled 1200 times with the following results: 5

No. that comes up	1	2	3	4	5	6
Frequency	195	289	202	242	163	109

Test the hypothesis, if the dice is unbiased at 5% level of significance (Given that $\chi^2_{0.05}(5) = 11.07$)

3. Calls at a telephone switchboard occur at an average rate of 6 calls per 10 minutes. Suppose the operator leaves for a 5 minutes coffee break. What is the probability that exactly two calls occur while the operator is away? 5

4. Fit a linear trend $y = a + b*$ (Demand), to the data collected from an umbrella manufacturing unit: 5

Month	1	2	3	4	5	6
Demand	46	56	54	43	57	56

5. Construct ANOVA table for one-way classification. 5

6. Briefly discuss, any two of the following: 5

   (i) Goodness of fit test

   (ii) Binomial distribution

   (iii) t-test for mean

Section-B

7. In a partially destroyed laboratory, legible record for correlation analysis of data is preserved as follows:

   (a) Variance of $x = 9$

   (b) Regression equations:

   (i) $8x - 10y + 66 = 0$

   (ii) $40x - 18y - 214 = 0$

   Analyse the preserved records and determine:

   (i) The mean of x and y.

   (ii) The coefficient of correlation between x and y.

   (iii) The standard deviation of y.

   10

8. The following table shows the sample values of 3 independent normal random variables i.e. X_1, X_2 and X_3. Assuming that they have equal variance, test the hypothesis that they have the same mean, by using ANOVA (Given $F_{(2,9)}^{(0.05)} = 4.26$) 10

X_1:	13	11	16	22
X_2:	16	8	21	11
X_3:	15	12	25	10

9. What do you understand by the term "Time Series"? Discuss all the categories in which Time Series is classified. 10

10. Discuss the term "Systematic Sampling". Differentiate between Linear and Circular systematic sampling. Give two advantages and limitations of systematic sampling. 10

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