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BCS-040

BACHELOR OF COMPUTER APPLICATIONS (BCA) (Revised)

Term-End Examination

00556

June, 2016

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) Non-scientific calculator is allowed.

SECTION A

1. The mean and standard deviation of 20 items is found to be 10 and 2, respectively. At the time of checking it was found that one noted item with value 8 was incorrect. Calculate the mean and standard deviation, if the wrong item is deleted. *5*

2. Let x_1 and x_2 be two independent random variables with variances $Var(x_1) = k$, $Var(x_2) = 2$. If the variance of $y = 3x_2 - x_1$ is 25, then find k. *5*

3. (a) State and prove the Addition theorem of probability. 2

(b) Suppose that A and B are two independent events, associated with a random experiment. The probability of occurrence of event A or B is 0·8, while the probability of occurrence of event A is 0·5. Determine the occurrence of probability of event B. 3

4. (a) What do you understand by a random variable ? Define the types of random variables. 2

(b) A bag contains 10 white and 3 black balls. Balls are drawn one by one without replacement till all the black balls are drawn. Find the probability that all black balls are drawn by the 6^{th} draw. 3

5. A survey of 64 medical labs revealed that the mean price charged for a certain test was ₹ 120, with a standard deviation of ₹ 60. Test whether the data indicates that the mean price of this test is more than ₹ 100 at 5% level of significance. 5

SECTION B

6. Describe the following tests in detail : *10*

(a) Paired t-test

(b) Chi-Square test for independence of Attributes

7. Differentiate between any ***two*** of the following : *10*

(a) Simple Random Sampling With Replacement and Simple Random Sampling Without Replacement

(b) Probability (Random) Sampling and Non-Random Sampling

(c) One-Sample Test and Two-Sample Test

8. The following table shows the sample values of 3 independent normal random variables. Test whether they have the same mean [use ANOVA]. Given $F_{0\cdot05}(2, 9) = 4\cdot26$. *10*

X_1	:	13	11	16	22
X_2	:	16	08	21	11
X_3	:	15	12	25	10

9. (a) Discuss the following : *4*

(i) Control chart for variables

(ii) Control chart for attributes

(b) Describe control chart for $\overline{X}$ and R in detail. Also suggest when R-chart and S-chart can be used. *5+1*