

**BACHELOR OF COMPUTER APPLICATIONS  
(Revised)**

**Term-End Examination**

**December, 2014**

04914

**BCS-040 : STATISTICAL TECHNIQUES**

*Time : 2 hours*

*Maximum Marks : 50*

**Note :**

- (i) Attempt both Sections, A and 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. Given the following sample of 20 numbers :

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

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- (a) Compute mean, variance and standard deviation.
- (b) If the largest value in the above set of numbers is changed to 500, to what extent are the mean and variance affected by the change ? Justify your answer.

2. The probability that at least one of the two independent events occurs is 0.5. Probability that the first event occurs but not the second is  $\frac{3}{25}$ . Also the probability that the second event occurs but not the first is  $\frac{8}{25}$ . Find the probability that none of the two events occurs. 5
3. Calls at a telephone switchboard occur at an average rate of 6 calls per 10 minutes. Suppose the operator leaves for a 5-minute coffee break. What is the probability that exactly two calls occur while the operator is away? 5
4. A Statistics professor has given five tests. A student scored 70, 75, 65, 80 and 95 respectively in the five tests. The professor decides to determine his grade by randomly selecting a sample of 3 test scores. Construct the sampling distribution for this process. 5
5. Briefly discuss any *two* of the following :  $2\frac{1}{2} + 2\frac{1}{2} = 5$
- (a) Goodness of fit test
  - (b) Test about the mean for paired values
  - (c) Regression

## SECTION B

6. What do you understand by the term "Time Series"? Discuss all the categories in which Time Series is classified (in 100 words each). 10
7. Discuss the term Systematic Sampling. Differentiate between Linear and Circular systematic sampling. Give two advantages and limitations of Systematic Sampling. 10
8. A group of 1650 school children were classified according to their performance in school tests and family economic level. Test if there is any association between these two attributes (Given  $\chi^2_{0.05}(9) = 16.918$ ). 10

Performance Economic Level	Performance				Total
	Very Good	Good	Average	Poor	
Very Rich	4	7	16	25	52
Rich	13	37	79	73	202
Average	105	372	298	175	950
Poor	35	213	75	123	446
Total	157	629	468	396	1650

9. A hosiery mill wants to estimate how its monthly costs are related to its monthly output rate. For that the firm collects a data regarding its costs and output for a sample of nine months as given below :

Output (Tons)	1	2	4	8	6	5	8	9	7
Production Cost (Thousands of dollars)	2	3	4	7	6	5	8	8	6

- (a) Calculate the best linear regression line.
- (b) Use this regression line to predict the firm's monthly costs if they decide to produce 4 tons per month.

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