

**BACHELOR OF COMPUTER APPLICATIONS  
(BCA) (Revised)**

**Term-End Examination**

**June, 2021**

**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. An Automobile service centre performed the following number of car services each month :

15, 18, 25, 40, 25, 18, 25, 21, 30, 33, 25, 20, 10, 28,  
36, 15, 26, 35, 20, 21, 32, 40, 32, 16, 12, 14, 22, 26,  
37, 16.

- (i) Construct a continuous frequency distribution of the above data by taking suitable class width.
- (ii) Draw the histogram of constructed continuous frequency distribution in part (i). 5

2. 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 below :

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

Also calculate the sample mean from the selected units.

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3. A shopkeeper claims that the average life of a CFL Bulb is 1600 hours. To check this claim, a researcher takes a sample of 100 CFL bulbs of the same make randomly and finds mean lifetime of 1570 hours with standard deviation of 120 hours. Is the claim acceptable at 5% level of significance ? [Given that  $Z = \pm 1.96$ ]

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4. The incidence of occupational disease in an industry is such that the workers have a 20% chance of suffering from it. What is the probability that out of six workers

- (i) Four or more will contract the disease ?  
(ii) Three will contract the disease ?

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5. Differentiate between the following with one example of each :

- (i) Assignable causes and Chance causes  
(ii) Producer's risk and Consumer's risk

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6. Use moving average of length 3 for the data on sales given in following table :

<i>Month</i>	<i>Sales</i>
1	25
2	15
3	30
4	38
5	58
6	62
7	85
8	88
9	60
10	40
11	40
12	38

Calculate the moving average and plot it against the appropriate month. Also plot the data in the same graph.

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## SECTION B

7. A researcher wishes to test whether a person's cholesterol level will change if the diet is changed. She takes a sample of 15 persons and divides them into 3 diet groups randomly. The data of cholesterol levels (in mg/deciliter) for the three groups are given below :

<i>Cholesterol Levels</i>		
<i>Diet 1</i>	<i>Diet 2</i>	<i>Diet 3</i>
190	210	170
170	200	200
210	230	210
180	210	200
200	190	205

Test whether the average effect of different diets on cholesterol level differs significantly at 5% level of significance.

[Given that  $F_{(2, 12)}(0.05) = 3.885$ ]

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8. The following contingency table presents the analysis of 300 persons according to hair colour and eye colour :

<i>Hair Colour</i>	<i>Eye Colour</i>		
	<i>Blue</i>	<i>Grey</i>	<i>Brown</i>
Burgundy	30	10	40
Brown	40	20	40
Black	50	30	40

Test the hypothesis that there is an association between hair colour and eye colour at 5% level of significance. [Given that  $\chi_{4, 0.05}^2 = 9.48$ ]

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9. Determine a regression equation  $y = a + bx$  for the data given in the table below :

x	y
1	2
1	3
2	5
3	6
4	8
4	8
5	9
6	10
6	9
7	11

Use fitted regression line to predict y when  $x = 8$ .

Draw a scatter diagram to represent the data. 10

10. Write short notes on any **two** of the following : 5×2=10

- (i) Exponential Smoothing Method
  - (ii) Cluster Sampling
  - (iii) Correlation and Rank-correlation
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