

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

Term-End Examination

December, 2018

02663

BCS-040 : STATISTICAL TECHNIQUES

Time : 2 hours

Maximum Marks : 50

Note :

- (i) Attempt both Section A and Section B.
- (ii) Attempt any **four** questions from Section A.
- (iii) Attempt any **three** questions from Section B.

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 item with value 8 was incorrect. Calculate the mean and standard deviation if the wrong item is omitted. 5
2. A population consists of the numbers 2, 5, 7, 8 and 10. Write all possible simple random samples of size 3 (without replacement). Verify that the sample mean is an unbiased estimator of the population mean. 5

3. A random sample of 10 males from a normal population showed a mean height of 66 inches and the sum of squares from this mean is equal to 90 sq inches. Is it reasonable to believe that the average height is greater than 64 inches ? Justify your answer at 5% level of significance (Use $t_{0.05}(9) = 2.26$). 5

4. Write short notes on any *two* of the following : $2 \times 2 \frac{1}{2} = 5$

(a) Simple Random Sampling

(b) Systematic Sampling

(c) Stratified Sampling

5. A random sample of size 64 has been drawn from a population with standard deviation 20. The mean of the sample is 80.

(a) Calculate 95% confidence limits for the population mean.

(b) How does the width of the confidence interval change if the sample size is 256 instead ? 5

6. Box A contains 5 red and 4 blue balls, Box B contains 2 red and 5 blue balls. A ball is drawn at random from each box. Find the probability that one is red and the other is blue. 5

SECTION B

7. The following table gives data for a sample of married women, the level of education and marriage adjustment score :

Level of Education	Marriage Adjustment Score		
	Low	High	Very High
Middle School	25	5	10
High School	50	30	40
College	120	60	60

Can you conclude from the above, the higher the level of education, the greater is the adjustment in marriage ? Justify. Given that $\chi_{0.05}^2(4) = 9.488$. 10

8. Refill of cartons with apple juice is taking place in a plant. Data for 14 days was collected and 100 cartons were checked every day for proper filling. Data is as given below :

S. No.	X
1	8
2	2
3	4
4	1
5	3
6	3
7	2
8	4
9	9
10	7
11	5
12	8
13	5
14	9

Compute the UCL, LCL and CL using an appropriate control chart. Also draw the chart. 10

9. Plot the following data about demand for an item. Find the centred moving averages by taking $n = 3$. Use these to forecast the next two months' demand.

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Month	Demand
1	46
2	56
3	54
4	43
5	57
6	56
7	67
8	62
9	50
10	56
11	47
12	56

10. The following table gives the yield of a hybrid variety of wheat in quintals per acre from 17 trial plots of land treated with four types of fertilizers :

Treatment with fertilizers

A	B	C	D
24	31	39	38
39	25	41	32
35	26	33	35
	21	40	34
		45	26

Use ANOVA to test whether the effect of fertilizers differs in terms of average yields.

Given that $F_{0.05}(3, 13) = 3.41$.

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