C 23325

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Name..................................

Reg. No..............................

FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2017

(CUCBCSS—UG)

Complementary Course

STS 4C 04—APPLIED STATISTICS

Time : Three Hours

Maximum : 80 Marks

Use of Statistical table and calculator are permitted.

Part A

Answer all questions in one word.

Each question carries 1 mark

1. When the population consists of units arranged in a sequence, one would prefer ———— sampling.

2. Errors committed in presentation of data are categorized are ————.

3. The oscillatory movements in a time series is known as ————.

4. Simple average method is used to calculate ———— in a time series.

5. The control chart which is commonly used to control the dispersion of measurable quality characteristics is ————.

6. The technique of control chart was originated by ————.

7. ———— index formula is known as the ideal index number.

8. Historically the first index was constructed in the year ————.

9. The technique of Analysis of variance was developed by ————.

10. If all the units selected in the sample are not covered, its the problem of————.

(10 × 1 = 10 marks)

Part B

Answer all questions in one sentence.

Each question carries 2 marks

11. Define time series. Give an example.

12. What is meant by analysis of time series ?

13. Define rational subgroups.

14. When will you say that a production process in statistical control ?

Turn over

15. Mention any *two* advantages of stratified random sampling.

16. Define quantity index number.

17. State the basic assumptions in analysis of variance technique.

(7 × 2 = 14 marks)

Part C

Answer any **three** *questions.*
Each question carries 4 marks.

18. Distinguish between SRSWR and SRSWOR. Which method is more efficient ?

19. Explain seasonal variation in a time series.

20. Distinguish between chance and assignable causes in a production process.

21. Describe cluster sampling.

22. Explain the tests to be satisfied by a good index number.

(3 × 4 = 12 marks)

Part D

Answer any 4 questions.
Each question carries 6 marks.

23. Explain the construction of *p*-chart

24. What is ANOVA ? What is the significance of its study? Distinguish between one way and two way ANOVA.

25. Explain the ratio to moving average method of estimating seasonal variation in a time series.

26. Describe briefly the principal steps in a sample survey.

27. Explain the advantages and disadvantages of sampling over census.

28. The following data provides the values of sample mean and range for the samples of size 5:

Sample No.	:	1	2	3	4	5	6	7	8	9	10
Mean	:	11.2	11.8	10.8	11.6	11	9.6	10.4	9.6	10.6	10
Range	:	7	4	8	5	7	4	8	4	7	9

Calculate the central line control limits for mean chart and range chart.

(For $n = 5$, $A_2 = 0.577$, $D_4 = 2.115$, $D_3 = 0$).

(4 × 6 = 24 marks)

Part E

Answer any two questions.
Each question carries 10 marks.

29. (a) What do you understand by Statistical Quality Control ? Explain briefly its needs and uses in industry.

    (b) Describe the basic principles underlying the control charts.

30. Compute : (a) Laspeyre's price index ; and (b) Fisher's price index from the following data :

Items	Base year		Current year	
	Price	Quantity	Price	Quantity
A	4	8	9	10
B	3	7	5	8
C	4	6	8	5
D ·	2	5	4	7

31. (a) Explain : (i) Irregular variation ; and (ii) Cyclical variations in a time series.

    (b) Describe the method of least squares for fitting straight line trend in a time series.

32. To study the performance of three detergents and three different water temperatures the following whiteness readings were obtained.

Water Temperature	Detergent A	Detergent B	Detergent C
Cold water ...	57	55	67
Warm water ...	49	52	68
Hot water ...	54	46	58

Perform a two way analysis of variance and draw your conclusion.

(2 × 10 = 20 marks)