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

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

FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2016

(CUCBCSS–UG)

Complementary Course

STS 4C 04—APPLIED STATISTICS

Time : Three Hours

Maximum : 80 Marks

Use of Calculator and Statistical table are permitted.

Part A

*Answer **all** questions in one word.*
Each question carries 1 mark.

1. A study based on complete enumeration is called ———.

2. If 50 units are selected in a sample from 600 population units, then sampling fraction is ———.

3. The erratic variation in a time series is known as ———.

4. If the slope of trend line is positive, it shows ——— trend.

5. The control chart which is used to control number of defects per unit in a production process is ———.

6. Statistical Quality Control takes care of variation due to ——— causes.

7. Abbreviated form of analysis of variance is ———.

8. Factor reversal test in index numbers was invented by ———.

9. If the old series is connected with the new series of index numbers, it's known as ———.

10. Analysis of variance technique is used to test the equality of ———.

(10 × 1 = 10 marks)

Part B

*Answer **all** questions in one sentence.*
Each question carries 2 marks.

11. What do you mean by multiplicative model of a time series ?

12. Name the various components of a time series.

13. Define Statistical Quality Control

14. What are three sigma control limits ?

15. Define simple random sampling.

16. What is consumer price index number ?

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

(7 × 2 = 14 marks)

Turn over

Part C

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

18. Distinguish between seasonal variation and cyclical variation in a time series.

19. What are the uses of index numbers ?

20. Distinguish between process control and product control.

21. Explain stratified random sampling.

22. Describe sampling and non-sampling errors.

$(3 \times 4 = 12 \text{ marks})$

Part D

Answer any **four** *questions.*
Each question carries 6 marks.

23. Describe the technique of analysis of variance for a two way classification data.

24. Explain the method of least squares method of obtaining linear trend in a time series.

25. What are time reversal and factor reversal tests ? Show that Fisher's index number satisfies the tests.

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

27. How will you conduct a sample survey ? What special points should be kept in mind in the selection of sample and collection of data ?

28. Explain the construction of p chart.

$(4 \times 6 = 24 \text{ marks})$

Part E

Answer any **two** *questions.*
Each question carries 10 marks.

29. Draw control charts for mean and range using the following data (subgroup of size 5 being taken). Determine whether the process is under control.

Sample No :	1	2	3	4	5	6	7	8	9	10
Mean :	20	34	45	39	26	29	13	34	37	23
Range :	23	39	15	5	20	17	21	11	40	10

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

30. Compute (i) Laspeyre's price index and (ii) Paasche's prce index from the following data :

Items		Base Year		Current Year	
		Price	Quantity	Price	Quantity
A	...	10	40	12	45
B	...	11	50	11	52
C	...	14	30	17	30
D	...	8	28	10	29
E	...	12	15	13	20

31. Estimate the trend values from the following data by using four yearly moving averages :

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Production (in '000 tonnes)	464	515	518	467	502	540	557	571	586	612

32. Kerala Traders Co-operative Limited wishes to test whether the three salesmen A, B and C tend to make sales of the same size or whether they differ in their selling ability as measured by the average size of their sales. During the last week there have been 14 sale calls- A made for 5 calls, B made 4 calls and C made 5 calls. Following are the weekly sales record of three salesmen :

Salesman A (in thousand rupees)	Salesman B (in thousand rupees)	Salesman C (in thousand rupees)
300	600	700
400	300	400
300	300	400
500	400	600
0	—	500

Perform the analysis of variance and draw your conclusion.

(2 × 10 = 20 marks)