C 61252

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

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FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2019

(CUCBCSS—UG)

Statistics

STS 4C 04—APPLIED STATISTICS

Time : Three Hours

Maximum : 80 Marks

Use of Calculator and Statistical Tables are permitted.

Part A

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

1. If each and every unit of a population has equal chance of being included in the sample, it is known as —————.

2. A list or a map which serves as a guide to cover the population is known as —————.

3. The hypothesis which is to be tested for it's possible rejection is —————.

4. The classical method used to separate the assignable causes and chance causes of variation is —————.

5. The sales of a departmental store on Dussera and Diwali are associated with which component of a time series ?

6. The component of a time series attached to long-term variations is termed as —————.

7. The trend of economic activity can be studied with the help of —————.

8. Fisher's ideal index number is the ————— of Laspeyre's and Paasche's index numbers.

9. A ————— is a statistical device principally used for the study and control of repetitive processes.

10. A finite number of units produced during a definite period of time is called a —————.

$(10 \times 1 = 10$ marks)

Part B

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

11. Define stratification. What are the points to be observed under stratification ?

12. Explain any method of selecting a simple random sample.

Turn over

13. What do you mean by degrees of freedom ?

14. Discuss a time series and its importance.

15. What is time reversal test ?

16. What are the limitations of statistical quality control ?

17. Distinguish between control chart for variables and attributes.

$(7 \times 2 = 14$ marks

Part C

*Answer any **three** questions.*

Each question carries 4 marks.

18. The figures given below show the export of sugar from India for the years 1970-71 to 1979-80. Fi a straight line trend using semi-average method.

Years	Export (Lakh Tonnes)
1970-1971	3.9
1971-1972	1.3
1972-1973	1.1
1973-1974	4.4
1974-1975	9.4
1975-1976	9.6
1976-1977	3.4
1977-1978	2.5
1978-1979	8.6
1979-1980	2.9

19. Distinguish between p chart and np chart.

20. What are the advantages of sampling over census method ?

21. Define Laspeyre's and Paasche's index numbers for price and quantity.

22. What are the uses of index numbers ?

$(3 \times 4 = 12$ marks)

Part D

Answer any four questions.
Each question carries 6 marks.

23. Explain cluster sampling with an example.

24. Explain the test procedure of two-way ANOVA.

25. Explain factor reversal test. Check whether Laspeyre's and Paasche's indices satisfy factor reversal test.

26. What are the points to be observed while preparing a questionnaire ?

27. Explain the method of least squares for measuring trend. Also state the merits and demerits of this method.

28. State the criteria for detecting lack of control in mean and range charts.

(4 × 6 = 24 marks)

Part E

Answer any two questions.
Each question carries 10 marks.

29. Explain census method and sampling and discuss their merits and demerits.

30. Perform a two-way ANOVA on the data given below :

Sides of triangle	Measurements by pupils				
	A	B	C	D	E
a	5.44	5.41	5.43	5.42	5.43
b	5.43	5.41	5.42	5.43	5.44
c	5.45	5.42	5.43	5.43	5.44

31. A dry-cells producing factory wanted to test the life of cells produced daily. The cells will be considered satisfactory if their life is 25 hours. For this a sample of 5 cells was drawn on 12 consecutive days. The results were as follows :

Days	Life of cells (in hours)				
	1	2	3	4	5
1	27.0	28.0	25.5	26.5	23.0
2	23.5	27.5	26.0	27.0	29.0
3	27.5	27.0	28.0	26.5	24.5
4	28.0	26.5	27.5	28.5	27.0
5	27.5	24.5	25.0	26.0	27.5
6	26.5	26.0	27.0	27.5	26.0
7	21.0	22.0	28.0	26.5	25.0
8	25.5	24.5	25.0	27.5	27.5
9	28.0	26.5	30.0	29.5	27.0
10	25.0	27.0	26.5	24.5	23.0
11	22.0	26.5	27.5	23.5	25.5
12	26.0	28.0	27.0	30.0	29.0

(i) Calculate 3σ - limits of control chart for mean when the value of mean of the universe 25 hours and standard deviation is 2 hours.

(ii) Draw a range chart when standard values are not specified.

32. Compute Laspeyre's, Paasche's and Fisher's price index from the following data :

Commodities	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	10	12	12	15
B	7	15	5	20
C	5	24	9	20
D	16	5	14	5

(2 × 10 = 20 mark