21U430S (Pages: 3) Name: ……..…….

Reg. No……..…….

FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2023

(CBCSS-UG)

CC15U ST4 C04 - APPLIED STATISTICS

(Statistics – Complementary Course)

(2015 to 2018 Admissions – Supplementary/Improvement)

Time: Three Hours Maximum: 80 Marks

Part A

Answer ***all*** questions. Each question carries 1 mark.

1. A time series consists of ..... components.
2. The component of a time series attached to long-term variations is termed as .....
3. The condition for the factor reversal test to hold is .....
4. The index number which satisfy both time reversal and factor reversal test is.....
5. Index number for the current period is taken as.....
6. The technique of Analysis of Variance was first devised by .....
7. The total degrees of freedom for two-way ANOVA with '4' rows and '6' column is .....
8. Analysis of variance technique is used to test the equality of .....
9. Variations beyond of the human being are termed as.....
10. Variations in items produced in a factory may be due to.....

(10 × 1 = 10 Marks)

Part B

Answer ***all*** questions. Each question carries 2 marks.

11. What is stratified sampling?.
12. State the null hypothesis of one way ANOVA.
13. What do you mean by cyclic variation?
14. What do you mean by additive model of time series ?
15. Define index number.
16. What is meant by Quality Control?
17. Write down control limits for C Chart.

(7 × 2 = 14 Marks)

Part C

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

18. Write down the normal equation for fitting a parabola.

19. What are weighted index numbers?

20. Distinguish between process control and product control.

21. What do you understand by Statistical control of production process.

22. State three assumptions of ANOVA technique.

(3 × 4 = 12 Marks)

Part D

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

23. Explain components of time series.

24. Explain the method of moving average of obtaining trend. What are the merits and demerits of this method?

25. Explain one way ANOVA.

26. The following are the figures of defectives in 22 lots each containing 2,000 rubber belts: 425, 430, 216, 341, 225, 322, 280, 306, 337, 305, 356, 402, 216, 264, 126, 409, 193, 326, 280, 389, 451, 420. Draw control chart for fraction defective and comment on the state of control of the process.

27. Explain the construction of control charts for the sample mean.

28. Give the control limits for (i) np - chart (ii) p - chart (iii) mean - chart.

(4 × 6 = 24 Marks)

Part E

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

29. Explain the steps in the construction of index numbers.

30. For the data given below, examine whether the following formulas satisfy time reversal test. (a) Laspeyer's index number (b) Paasche's index number (c) Fisher's index number.

Commodities	p_0	q_0	p_1	q_1
A	3	4	4	3
B	9	3	10	4
C	6	6	7	6
D	5	3	6	4
E	4	5	5	3

31. The following table shows the number of missing rivets observed at the time of inspection of 12 aircrafts. Find the control limits for the number of defects and draw the control chart. Also state the result.

Aircraft No.	1	2	3	4	5	6	7	8	9	10	11	12
No.of missing rivets	7	15	13	18	10	14	13	10	20	11	22	15

32. The following figures relate to production in kg. of three varieties A, B and C of wheat sown in 12 plots.

A	14	16	18		
B	14	13	15	22	
C	18	16	16	19	20

Is there any significant difference in the production of 3 varieties?

(2 × 10 = 20 Marks)

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