

D 41990

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Name _____

Reg. No. _____

FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2018

(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. Stratified random sampling is appropriate when the groups of items in a population are _____.
2. Probability of including a specified unit in a sample of size 100 selected out of 800 units is _____.
3. The consistent increase in production of wheat constitutes _____ component of a time series.
4. If the origin in a trend equation $Y = A + BX$ is shifted backward by two years, the variable X in the trend equation will be replaced by _____.
5. Name the average which is most suitable for the construction of index numbers.
6. The weights used in Paasche's index formula are _____.
7. _____ distribution is commonly used to construct c-chart in a manufacturing process.
8. The main tool of process control is the technique of _____.
9. In a production process, variation due to _____ is beyond the control.
10. In an ANOVA table, if total sum of squares is 258 with degrees of freedom 19 and sum of square between sample is 50 with degrees of freedom 3, the mean error sum of squares is _____.

(10 × 1 = 10 marks)

Part B

Answer all questions in one sentence.

Each question carries 2 marks.

Point out the utility of time series.

What are irregular variations in a time series?

What is a control chart?

Turn over

14. Define sampling unit and sampling frame.
15. What do you understand by random sampling?
16. Define Fishers index number.
17. Distinguish between defective and defect in a manufacturing process.

(7 × 2 = 14 marks)

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

18. Define seasonal variation in a time series. Give examples.
19. Distinguish between control chart for variables and control chart for attributes.
20. Define : (i) time reversal test and (ii) factor reversal test.
21. Explain systematic sampling.
22. Mention any four situations where sampling is inevitable.

(3 × 4 = 12 marks)

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

23. What do you understand by ANOVA? Stating the basic assumptions, how will you test the equality of means of several normal populations?
24. Explain the moving average method of obtaining trend in a time series. Mention its merits and demerits.
25. Define Laspeyre's and Paasche's index numbers. What are the types of bias appears in Laspeyre's and Paasche's formulae?
26. Distinguish between SRSWOR and SRSWR. Explain the lottery method of random sample selection.
27. Explain sampling error and non sampling errors. How these errors can be controlled in a survey?
28. A plant produces rolls of paper. The number of defects per unit observed by the inspection of 10 rolls are as follows: 3, 4, 5, 6, 3, 3, 5, 3, 6, 2. Draw suitable control chart and comment on the state of control of the process.

(4 × 6 = 24 marks)

Part E

Answer any two questions.
Each question carries 10 marks.

29. Explain the construction of control charts for mean and range in a manufacturing process.
30. A tea company appoints four salesmen A, B, C and D and observes their sales in three seasons-summer, winter and monsoon. The figures (in lakhs) are given in the following table :

Season	Salesmen			
	A	B	C	D
Summer	36	36	21	35
Winter	28	29	31	32
Monsoon	26	28	29	29

Perform a two way ANOVA on the data given above.

31. Compute Fishers ideal index number from the following data :

Commodity	Base period		Current period	
	Price	Expenditure	Price	Expenditure
A	2	40	5	75
B	4	16	8	40
C	1	10	2	24
D	5	25	10	60

32. Calculate the seasonal index from the following data using the simple average method :

Year	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
1999	72	68	80	70
2000	76	70	82	74
2001	74	66	84	80
2002	76	74	84	78
2003	78	74	86	82

(2 × 10 = 20 marks)