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D 13619 **(Pages : 2)** **Name.......................................**

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

FIRST SEMESTER (CBCSS-UG) DEGREE EXAMINATION NOVEMBER 2021

Statistics

STA 1C 01—INTRODUCTORY STATISTICS

(2019—2020 Admissions)

Time : Two Hours Maximum : 60 Marks

Use of calculator and Statistical table are permitted.

Part A (Short answer type Questions)

Each question carries 2 marks.
Maximum marks that can be scored from this part is 20.

1. Expand : (i) CSO ; and (ii) NSSO.
2. Define discrete and continuous data.
3. Define schedule for data collection.
4. Define : (i) Median ; and (ii) Mode.
5. Find the geometric mean of 1, 2, 8 and 16.
6. Define upper and lower outer fences in a box plot.
7. Define co-efficient of quartile deviation.
8. For two variables X and Y, why the regression co-efficients never differ in their signs.
9. One of the regression lines for the variables X and Y is $2x + 3y - 6 = 0$. If the mean of X is 3, identify the mean of Y.
10. Define seasonal variation in a time series.
11. Define index numbers.
12. Define Marshall-Edgeworth index number.

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230469

Part B (Short Essay/Paragraph type Questions)

Each question carries 5 marks.
Maximum marks that can be scored from this part is 30.

13. Write a short note on DES.

14. Write any five points to be considered while designing a questionnaire.

15. Calculate the harmonic mean of the observations $1, \frac{1}{2}, \frac{1}{3}, \ldots, \frac{1}{n}$.

16. State principle of least square and explain the fitting of a curve of the form $y = ab^x$ to the data $(x_1, y_1), (x_2, y_2), \ldots (x_n, y_n)$.

17. Derive an expression for the angle between two regression lines for X and Y.

18. Define Pearson's co-efficient of correlation. For 12 observations on the variables X and Y, given $\sum x = 48, \sum y = 60, \sum x^2 = 288, \sum y^2 = 512$, and $\sum xy = 384$. Calculate Pearson's co-efficient of correlation between X and Y.

19. Show that Laspayer's and Paache's index numbers are not satisfying factor reversal test of index numbers.

Part C (Essay type Questions)

Each question carries 10 marks.
Maximum marks that can be scored from this part is 10.

20. Define raw and central moments. Derive an expression for r^{th} central moment in terms of raw moments. Explain how skewness and kurtosis are measured using moments.

21. Profit after tax (in lakhs) earned by a small scale industry in last 6 years are given as follows :

Year	:	2015	2016	2017	2018	2019	2020	2021
Profit	:	6.2	7.4	8.1	7.6	8.4	8.6	8.2

Fit a trend line using least square method and estimate the profit for the year 2025.

Also find three year moving average values using the given data.