D 113942 (Pages : 3) Name.....................................

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

FIRST SEMESTER (CBCSS—UG) DEGREE EXAMINATION NOVEMBER 2024

Statistics

STA 1C 01—INTRODUCTORY STATISTICS

(2019—2023 Admissions)

Time : Two Hours Maximum : 60 Marks

Part A (Short Answer Type Questions)

Each question carries 2 *marks.*

Maximum marks that can be scored from the part is 20.

1. Write any *two* surveys conducted by NSSO.

2. Distinguish between qualitative and quantitative characteristics. Give an example of each.

3. Define median and explain the formula for calculating it from a frequency table.

4. What happens to the standard deviations when every observations is : (i) increased by 4 ; and (ii) multiplied by 4.

5. State the limitations of statistics.

6. Write the differences between bar diagram and histogram.

7. What is kurtosis ? Give the moment measure of kurtosis.

8. What are regression coefficients ? How they are related to correlation co-efficient ?

9. The co-efficient of correlation between X and Y is 0.6. Their covariance is 4.8. The variance of X is 9. Find the standard deviation of Y.

10. Explain the term cyclical variations.

11. What are the different methods used for measuring trend ?

12. Define index numbers. Mention its uses.

Turn over

Part B (Short Essay/ Paragraph Type Questions)

Each question carries 5 *marks.*

Maximum marks that can be scored from the part is 30.

13. Discuss the activities of CSO.

14. Define secondary data. State their chief sources.

15. Obtain the quartile deviation for the following data.

Class	:	0-10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
Frequency	:	5	9	20	31	18	11	6

16. Calculate co-efficient of correlation for the following data.

x :	12	9	8	10	11	13	7
y :	14	8	6	9	11	12	3

17. Explain the method of fitting a parabola of the form $y = ax^2 + bx + c$ to a given bivariate data.

18. What is a scatter diagram ? What information about the data is conveyed by a scatter diagram ?

19. Define trend. Explain the free hand curvc method for measuring trend.

Part C (Essay Type Questions)

Answer any **one** *question.*

The question carries 10 *marks.*

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

20. Calculate the coefficient of skewness based on quartiles for the following data.

Class	:	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80
Frequency	:	3	9	6	12	4	8	2

21. Given the following data of prices and quantities of three representative consumer goods for the base year and current year. Calculate : (i) Laspeyre's index number ; (ii) Paasche's index number ; and (iii) Fisher's index number.

Commodity	Base year		Current year	
	q_0	p_0	q_k	p_k
1	6	40	7	30
2	4	45	5	50
3	0.5	90	1.5	40

D 53695　　　　　　　　(Pages : 3)　　　　　Name...

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FIRST SEMESTER [CBCSS–UG] DEGREE EXAMINATION, NOVEMBER 2023

Statistics

STA 1C 01—INTRODUCTORY STATISTICS

(2019–2023 Admissions)

Time : Two Hours　　　　　　　　　　　　　　　　　　　Maximum : 60 Marks

Part A (Short Answer Type Questions)

Each Question carries 2 *marks.*
Maximum marks that can be scored from the part is 20.

1. Expand (i) CSO and (ii) NSSO.

2. Distinguish between questionnaire and schedule.

3. Draw a histogram and a frequency polygon for the following data :

Marks	:	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	:	5	8	15	20	12	7

4. For a frequency distribution, median = 132.8, mode = 141.3, find mean.

5. What are the desirable properties of a good measure of dispersion?

6. Define quartile deviation and write any one demerit of quartile deviation.

7. What are positive and negative skewness ?

8. Distinguish between correlation and regression.

9. Define Karl Pearson's coefficient of correlation and state any one of its property.

10. What are the uses of index numbers ?

11. What do you mean by components of a time series ? List out the components of a time series.

12. What are irregular variations ? How are they differ from cyclical variations ?

Turn over

Part B (Short Essay/ Paragraph Type Questions)

Each question carries 5 marks.

Maximum marks that, can be scored from the part is 30.

13. Discuss the various scaling techniques used for measuring data.

14. Write short note on any two Central Government Statistical Organizations.

15. Draw less than ogive for the following data :

Class	:	0–20	20-40	40-60	60-80	80-100
No. of students	:	10	15	30	35	10

16. Fit a curve of the form $y = ax^b$ for the following data :

x	:	30	35	40	45	50
y	:	120	50	25	8	2

17. The number of employees, average wage per employee and the variance of the wages per employee for two factories is given below :

		Factory A	Factory B
Number of employees	:	100	150
Average wage per employee per day (Rs)	:	3200	2800
Variance of the wages per employee per day (Rs)	:	625	729

In Which factory is there greater variation in the distribution of wages per employee ?

18. If $9x - 4y + 15 = 0$ the regression line of y on x and $25x - 6y - 7 - 0$ is the regression line of x on y, find r_{xy}.

19. Calculate Karl Pearson's coefficient of correlation for the following data :

x	:	12	9	8	10	11	13	7
y	:	14	8	6	9	11	12	3

Part C (Essay Type Questions)

Answer any **one** *question.*
The question carries 10 *marks.*
Maximum marks that can be scored from the part is 10.

20. (i) Explain the method of semi-average for finding trend.

    (ii) Fit a trend line to the following data using semi-average method :   .

Year	:	2010	2011	2012	2013	2014	2015
Profit	:	34	34	34	34	32	39

21. Find the mean deviation from the median for the following data :

Size	:	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	:	7	12	18	25	16	14	8

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.

Turn over

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 $1, \frac{1}{2}, \frac{1}{3}, ..., \frac{1}{n}$.

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

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.

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FIRST SEMESTER (CBCSS–UG) DEGREE EXAMINATION NOVEMBER 2021

Statistics

STA 1C 01—INTRODUCTORY STATISTICS

(2021 Admissions)

Time : Two Hours Maximum : 60 Marks

Use of Calculator and Statistical tables are permitted.

Section A

*Answer atleast **eight** questions.*
Each question carries 3 marks.
All questions can be attended.
Overall ceiling 24.

1. Expand CSO and mention any two of its responsibilities.

2. Distinguish between questionnaire and schedule.

3. Name any four different types of bar diagrams.

4. If the variance of $x_1, x_2,...x_n$ is k, identify the variances of the sets :

    (i) $x_1 - 5, x_2 - 5,...,x_n - 5$; (ii) $5x_1, 5x_2,...,5x_n$.

5. Find the mean deviation about median of the observations, 4, 7, 15, 12, 10 and 18.

6. Define H-spread.

7. Second, third and fourth central moments of a data are 5.2, 2 and 30 respectively. Obtain the co-efficients of skewness and kurtosis.

8. What are the regression co-efficients and state their relation between Pearson's co-efficient of correlation for two variables X and Y ?

9. Comment on the co-efficient of correlation between two variables X and Y, if the angle between the regression lines : (i) 0º ; and (ii) 90º.

10. Define cyclical and irregular variation in a time series data.

Turn over

11. Define "base year" and "current year" while constructing index numbers.

12. Define Laaspayer's and Paasche's price index numbers.

$(8 \times 3 = 24 \text{ marks})$

Section B

Answer atleast **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall ceiling 25.

13. Write a short note on the statistical system in India.

14. Differentiate between primary and secondary data. Explain various methods for collecting primary data.

15. Explain kurtosis and its measure based on moments.

16. State the principle of least squares for curve fitting. Explain the method of fitting a curve $y = ae^{hx}$ using the observations $(x_1, y_1), (x_2, y_2), ..., (x_n, y_n)$ and x and y.

17. Obtain the regression line x on y and regression line y on x using the following data on x and y :

x	:	8	12	15	17	20	23	25
y	:	10	15	16	20	25	30	35

18. Show that Pearson's co-efficient of correlation is invariant under linear transformation.

19. Explain the method of semi-average for finding the secular trend in a time series data.

$(5 \times 5 = 25 \text{ marks})$

Section C

Answer any **one** *question.*
The question carries 11 *marks.*

20. (i) Define Dispersion. Calculate the mean deviation about median for the following data :

| Class	:	5–15	15–25	25–35	35–45	45–55	55–65	65–75
Frequency	:	4	11	19	30	10	4	2

(ii) Define raw and central moments. Express r^{th} central moment in terms of raw moments and hence obtain the expression for fourth central moment.

21. (i) Define Index Numbers. Explain various types of index numbers.

(ii) Calculate Fisher's index number for the following data :

Items	Quantity		Price	
	2016	2021	2016	2021
A	12	18	18	24
B	14	17	18	22
C	11	12	15	14
D	19	24	26	26
E	8	10	12	17

$(1 \times 11 = 11 \text{ marks})$

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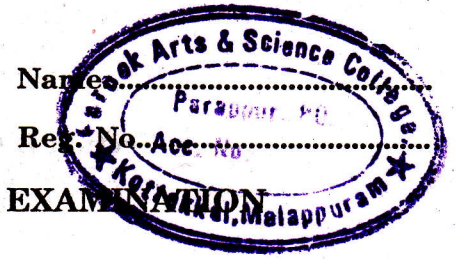
FIRST SEMESTER (CBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2020

Statistics

STA 1C 01—INTRODUCTORY STATISTICS

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

Use of Calculator and Statistical table are permitted.

Section A (Short Answer Type Questions)

Answer at least **eight** *questions.*
Each question carries 3 marks.
All questions can be attended.
Overall Ceiling 24.

1. Expand NSSO. Write any *two* of its responsibilities.

2. Define primary and secondary data.

3. Define population and sample.

4. For a set of observations, show that sum of deviation of the observations from their arithmetic mean is zero.

5. Define quartiles and quartile deviation.

6. Define outliers in a box plot.

7. What is the variance of a set of values with mean and co-efficient of variation are respectively 20 and 60 % ?

8. Define Scatter diagram.

9. Calculate the coefficient of correlation between x and y, where the regression coefficients are $-\dfrac{16}{3}$ and $-\dfrac{1}{12}$.

10. Define time series and write any *two* of its objectives.

11. Define secular trend in a time series.

12. Differentiate price and quantity index numbers.

(8 × 3 = 24 marks)

Turn over

Section B (Short Essay/Paragraph Type Questions)

Answer at least five questions.
Each question carries 5 marks.
All questions can be attended.
Overall Ceiling 25.

13. Write a brief note on the statistical system in states.

14. Point out any *five* main differences between questionnaire and schedule.

15. First four raw moments of a set of data are − 2, 8, 24 and 260. Calculate the first four central moments.

16. State principle of least square and fit a straight line of the form $y = ax + b$ to the following data on x and y :

x	:	4	6	8	10	12
y	:	12	15	22	34	40

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

18. For two variables x and y, show that $-1 \le r_{xy} \le 1$, where r_{xy} is Pearson's co-efficient of correlation.

19. What are seasonal indices ? Calculate the seasonal indices for the quarters from the following data on the values of an item by the method of simple averages :

Year	1st quarter	2nd quarter	3rd quarter	4th quarter
2011	24	26	38	30
2012	22	28	42	28
2013	26	30	40	32
2014	24	26	38	34
2015	28	30	42	30

(5 × 5 = 25 marks)

Section C (Essay Type Questions)

Answer any **one** *question.*
The question carries 11 marks.

20. Find the median marks of 100 students from the following data. Also locate median graphically by drawing ogives :

Marks	:	0–10	10–20	20–30	30–40	40–50	50–60	60–70
Students	:	3	14	22	34	16	7	4

21. (i) Explain the problems while constructing index numbers.

   (ii) Explain any *two* weighted price index numbers.

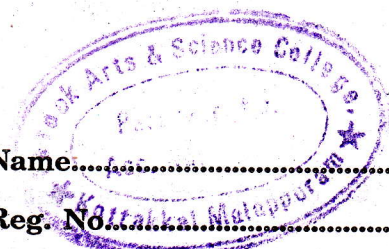   (iii) Show that Fisher's index number satisfies time reversal test.

$$(1 \times 11 = 11 \text{ marks})$$

D 73302

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

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

FIRST SEMESTER B.A./B.Sc. DEGREE EXAMINATION, NOVEMBER 2019

(CBCSS—UG)

Statistics

STA 1C 01—INTRODUCTORY STATISTICS

(2019 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) C SO (ii) D E S.

2. Define qualitative and quantitative data.

3. Define time series data.

4. Define : (i) central tendency (ii) average.

5. What is the sum of squares of 10 observations with mean 4 and variance 36 ?

6. Define : (i) H-spread (ii) Upper and Lower inner fences.

7. Write any two relative measures of dispersion.

8. Define curve fitting.

9. Two regression coefficients cannot be greater than 1 simultaneously. Justify.

10. Name the four components of a time series.

11. Define seasonal variation.

12. Define : (i) price and (ii) quantity index numbers.

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 NSSO.

14. Define primary data. What are the various methods of collecting primary data ?

15. Define moments. Derive an expression for r^{th} central moment in terms of raw moments.

Turn over

16. State principle of least square and explain the fitting of a curve of the form $y = ae^{bx}$ to the the data $(x_1, y_1), (x_2, y_2), ..., (x_n, y_n)$.

17. For the observations $(x_1, y_1), (x_2, y_2), ..., (x_n, y_n)$, derive the regression lines x on y and y on x.

18. Calculate Pearson's coefficient of correlation between X and Y, using the following data :

    X :   2   6   8   11   15   18
    Y :   6   9   10   14   20   21

19. Define secular trend. Explain the method of : (i) free hand curve and (ii) semi average method of finding trend.

Part C (Essay Type Questions)

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

20. Define skewness. Explain various measures of skewness. Calculate β_1 and comment on skewness of a set of data with first three raw moments 1, 4 and 10.

21. Explain : (i) unweighted index number (ii) weighted index number (iii) Any two uses of index numbers. Calculate Fisher's index number for the year 2017 based on 2010.

Items	Quantity		Price	
	2010	2017	2010	2017
A	12	16	20	24
B	6	9	16	18
C	9	13	8	11
D	19	22	12	18
E	15	20	15	16