

SECOND SEMESTER UG DEGREE EXAMINATION, APRIL 2025

(FYUGP)

CC24USTA2MN110 - DATA ANALYSIS FOUNDATIONS IN STATISTICS

(Statistics - Minor Course)

(2024 Admission - Regular)

Time: 2.0 Hours

Maximum: 70 Marks

Credit: 4

Part A (Short answer questions)

Answer all questions. Each question carries 3 marks.

- 1. Explain secular trend of time series with examble. [Level:2] [CO1]
- 2. Describe different simple index numbers. [Level:2] [CO2]
- 3. Describe the two regression lines. [Level:2] [CO3]
- 4. Describe the properties of correlation coefficient. [Level:2] [CO3]
- 5. Describe simple and partial correlation with example. [Level:2] [CO3]
- 6. Discuss scatter diagram with example. [Level:2] [CO3]
- 7. Discuss about the properties of regression coefficients. [Level:2] [CO3]
- 8. Provide the R code for determining the mean of the data : 28, 42, 12, 98, 36, 64. [Level:3] [CO4]
- 9. Provide R code to plot Pie diagram for the following data [Level:3] [CO4]

Result	First class	Second class	Third class	Fail
Number of students	21	27	9	3

- 10. Explain how do you export a dataset from R into a CSV file? [Level:2] [CO4]

(Ceiling: 24 Marks)

Part B (Paragraph questions/Problem)

Answer all questions. Each question carries 6 marks.

- 11. Demonstrate semi-average method of determining trend in time series. Draw a trendline by the semi-average method for the following data [Level:3] [CO1]

Year	1979	1980	1981	1982	1983	1984	1985	1986
Production (in tons)	140	142	143	141	144	143	146	148

12. Discuss different components in time series analysis. [Level:2] [CO1]

13. Prove that Fisher's index number satisfy both time reversal test factor reversal test. [Level:3] [CO2]

14. Calculate Fisher's index number for the following data. [Level:3] [CO2]

Commodity	Base Year		Current year	
	Price	Quantity	Price	Quantity
A	5.0	18	8.5	18
B	2.5	7	6.0	7
C	12.5	3	18.5	2
D	7.6	2	12.1	3
E	3.5	3	7.8	3

15. Calculate simple aggregative index number and simple average of price relative index number from the data given below [Level:3] [CO2]

Commodities	Price in 1970	Price in 1974
A	2	4
B	10	11
C	8	7
D	9	11
E	12	15

16. Compute rank correlation for the following data. The marks of 10 students in two subjects A and B are as follows [Level:3] [CO3]

A	45	20	48	18	36	41	50	28	32	49
B	42	36	45	26	40	47	51	23	31	44

17. Compute Spearman's rank correlation for the following data. The marks of 10 students in two subjects Maths and Statistics are as follows [Level:3] [CO3]

Maths	33	56	50	65	44	38	44	50	15	26
Statistics	50	35	70	25	35	58	75	60	55	26

18. Calculate coefficient of correlation between the sales and expenses of the following 10 firms. [Level:3] [CO3]

Sales	50	50	55	60	65	65	65	60	60	50
Expenses	11	13	14	16	16	15	15	14	13	13

(Ceiling: 36 Marks)

Part C (Essay questions)

Answer any *one* question. The question carries 10 marks.

19. Draw a graph of observed values and the trend values from the following data. Fit a straight line trend for the following data by the method of least squares and also estimate the production in the year 2003. [Level:3] [CO1]

Year	1995	1996	1997	1998	1999	2000	2001
Production	125	128	133	135	140	141	143

20. Determine the two regression lines from the data given below. [Level:3] [CO3]

X	120	90	83	150	130	140	110	95	75	105
Y	40	36	40	46	40	44	45	38	50	35

Estimate the value of X when Y = 48 and the value of Y when X = 135

(1 × 10 = 10 Marks)
