(i) **Printed Pages : 3** **Roll No. .....**

(ii) **Questions : 14** **Sub. Code :** | 1 | 7 | 8 | 2 | 0 |

Exam. Code : | 0 | 0 | 1 | 3 |

Bachelor of Commerce 3rd Semester

(2124)

BUSINESS MATHEMATICS AND STATISTICS

Paper : BCM-304

Time Allowed : Three Hours] **[Maximum Marks : 80**

Note :— (1) Attempt any **FOUR** questions from Section-A.
(2) Attempt **TWO** questions each from Sections B and C.

SECTION—A

1. Explain the properties of determinants. 5

2. Differentiate $x^2.\log x$. 5

3. Show that $\begin{bmatrix} 1 & 1 & 1 \\ a & b & c \\ a^2 & b^2 & c^2 \end{bmatrix} = (a-b)(b-c)(c-a)$. 5

4. Calculate Quartile Deviation from the following data :
12, 18, 25, 20, 27, 19, 30, 28. 5

5. "Index numbers are economic barometers". Explain the statement. 5

6. Distinguish between seasonal and cyclical fluctuations with suitable examples. 5

SECTION—B

7. If $A = \begin{bmatrix} 9 & 7 & 6 \\ 7 & -1 & 8 \\ 3 & 4 & 2 \end{bmatrix}$ Show that $AA^{-1} = |= A^{-1}A$. 15

8. Find $\frac{dy}{dx}$ when

(i) $Y = \text{Log}[x + \sqrt{x^2 + 1}]$

(ii) $Y = \frac{\sqrt{x+1}}{\sqrt{x-1}}$. 8,7

9. Explain the concept of Maxima and Minima giving their managerial applications. Clearly state the conditions for Maxima and Minima. 15

10. Find the maxima and minima of the functions :

$Y = (X-1)^3(X+1)^2$ 15

SECTION—C

11. Discuss the methods of collecting statistical data and types of classification of data. 15

12. Find the coefficient of skewness for the following data :

Marks (Less than)	10	20	30	40	50	60
No of Students	4	10	30	40	47	50

15

13. Calculate Fisher's Ideal Index number from given data. Does it satisfy the time reversal and factor reversal test ?

1995		1990	
Price	Quantity	Price	Quantity
1.25	62.50	1.00	60.00
2.50	50.00	1.50	37.50
3.00	30.00	2.00	20.00
18.00	72.00	12.00	36.00
0.15	9.00	0.10	4.00

15

14. Fit a straight-line trend by the method of least squares and tabulate the trend values :

Year	1977	1978	1979	1980	1981	1982	1983
Sales	70	75	90	91	95	98	100

What is the rate of growth of sales per month ? 15