(i) Printed Pages : 4] Roll No. .....

(ii) Questions : 14] Sub. Code : 0 8 2 0

Exam. Code : 0 0 1 3

Bachelor of Commerce 3rd Semester Examination

1127

BUSINESS MATHEMATICS AND STATISTICS

Paper : BCM-304

Time : 3 Hours] **[Max. Marks : 80**

Note :– (i) Attempt any *four* questions from Section A

(ii) Attempt any *two* questions from Section B.

(iii) Attempt any *two* questions from Section C.

Section–A 4×5=20

1. Define matrix and discuss the types of matrices.

2. If $A = \begin{bmatrix} 1 & 2 \\ 3 & -5 \end{bmatrix}$.

Then verify that A(adj A) = | A |I.

3. Differentiate $\log(xe^x)$ w.r.t. $x \log x$.

4. Give in brief the methods of collecting primary statistical data.

5. Find quartile deviation (Q.D.) from the following data :

Age (years)	0–20	20–40	40–60	60–80	80–100
Persons	4	10	15	20	11

6. Give merits and demerits of arithmetic mean.

Section–B $2\times15=30$

7. If $A = \begin{bmatrix} 1 & 3 & 4 \\ 3 & -1 & 6 \\ -1 & 5 & 1 \end{bmatrix}$ then verify that $(A')^{-1} = (A^{-1})'$.

8. Find $\frac{dy}{dx}$, if $y^x + x^y + x^x = a^b$.

9. Discuss the concept of maximum value and minimum value of the function of one variable. Also explain the criteria for determing these.

10. (a) **Prove that :**

$$\begin{vmatrix} 1+a^2-b^2 & 2ab & -2a \\ 2ab & 1-a^2+b^2 & 2a \\ 2b & -2a & 1-a^2-b^2 \end{vmatrix} = (1+a^2+b^2)^3 \qquad 7$$

(b) Find inverse of the following matrix by using elementary operations :

$$A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix} \qquad 8$$

Section–C $2\times15=30$

11. Discuss the problems in the construction of Index numbers.

12. Calculate mean deviation from median and its coefficient from the following data :

Size	Frequency
100–120	4
120–140	6
140–160	10
160–180	8
180–200	5

13. Fit a straight line trend by the method of least squares (taking 1978 as year of origin) to the following data :

Year	1979	1980	1981	1982	1983	1984
Production (Lakh tons)	5	7	9	10	12	17

Also obtain the trend values.

14. Discuss the methods of collecting statistical data and types of classification of data.