

Roll No.

Total No. of Pages : 02

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B.Sc.(IT)/BCA/DEP/DCA (Sem.-2)

**MATHEMATICS – II**

Subject Code : BSIT/BSBC-202

M.Code : 10051

Date of Examination : 06-07-22

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

**SECTION-A**

**1. Answer the following :**

- a) Symmetric and skew-symmetric matrices
- b) Rank of a Matrix
- c) Dispersion
- d) Simpson's  $\frac{1}{3}rd$  rule.
- e) Maxima and Minima.
- f) Evaluate  $\int_0^1 x(1-x)^5 dx$ .
- g) Find the inverse of matrix  $A = \begin{bmatrix} 2 & 5 \\ -3 & 1 \end{bmatrix}$ .
- h) If the sum of 20 observations is 300 and sum of squares is 5000 and median is 15. Find its coefficient of variation.
- i) Evaluate  $\int \frac{x^3}{1+x^4} dx$ .
- j) For what value of 'a' the matrix  $A = \begin{bmatrix} 1 & 4 \\ 2 & a \end{bmatrix}$  is a singular matrix.

## SECTION-B

2. Solve the following equation by Matrix – Inversion method

$$5x + 3y + z = 16$$

$$2x + y + 3z = 19$$

$$x + 2y + 4z = 25$$

3. Calculate Mean and Mode of following data

<b>Class</b>	6 – 7	7 – 4	14 – 21	21 – 28	28 – 35	35 – 42
<b>Frequency</b>	19	25	36	72	51	45

4. a) Differentiate the following *wrt*  $x$

i)  $\sin^{-1}\left(\frac{2x}{1+x^2}\right)$       ii)  $\frac{e^x + \sin 2x}{1 + \cos 2x}$

b) Evaluate  $\int \frac{dx}{(x+1)(x+2)}$ .

5. Evaluate  $\int_0^4 e^x dx$  by Simpson's  $\frac{1}{3}$ rd rule and Simpson's  $\frac{3}{8}$ th rule. Given that  $e = 2.72$ ,  $e^2 = 7.39$ ,  $e^3 = 20.09$ ,  $e^4 = 24.6$ .
6. Show that of all the rectangles of given areas the square has the smallest perimeter.
7. Evaluate  $\int e^x(1+x) \log(xe^x) dx$ .

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**