

BCA (Sem. – 2)

MATHEMATICS-II

Subject Code: BSBC/BSIT-202

M.Code : 10051

Date of Examination : 15-12-22

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) If $\begin{bmatrix} 2x+1 & 2y \\ 0 & y^2+1 \end{bmatrix} = \begin{bmatrix} x+3 & 10 \\ 0 & 26 \end{bmatrix}$

Write the value of $(x + y)$.

b) Find the values of x for which $\begin{vmatrix} 3 & x \\ x & 1 \end{vmatrix} = \begin{vmatrix} 3 & 2 \\ 4 & 1 \end{vmatrix}$

c) Differentiate $e^{\log(x+\sqrt{x^2+u^2})}$ w.r.t x .d) If $\sin x = y \sin(x + b)$. Show that $\frac{dy}{dx} = \frac{\sin b}{\sin^2(x+b)}$.

e) Define Median and Standard deviation with example.

f) Calculate the mean deviation from median and coefficient of mean deviation

20, 22, 25, 38, 40, 50, 65, 70, 75

g) Evaluate $\int \frac{x^3-1}{x^2} dx$.

h) Find $\int \sin^3 x dx$.

i) Evaluate $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \sin^3 x dx$.

j) State Simpson's $\frac{1}{3}$ rule.

SECTION B

2. For the matrix $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{bmatrix}$ Show that $A^3 - 6A^2 + 5A + 11I = 0$

Hence find A^{-1}

3. Using matrices solve the following system of equations

$$3x + 4y + 7z = 4$$

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

$$x + 2y - 3z = 8$$

4. a) Determine two positive numbers whose sum is 15 and the sum whose squares is minimum.

b) If $y = (x + \sqrt{x^2 + a^2})^n$ Prove that $\frac{dy}{dx} = \frac{ny}{\sqrt{x^2 + a^2}}$

5. a) Find $\int x \sin^{-1} x dx$

b) Evaluate $\int (3 - 2x)\sqrt{2 + x - x^2} dx$.

6. a) Evaluate $\int_0^6 \frac{1}{1+x^2} dx$ by using Simpson's $\frac{1}{3}$ rule.

- b) Calculate the Median of the following data

Marks:	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100
No. of Students :	0	5	22	25	16

7. a) Find the Standard deviation and Mean for the distribution of wages of 65 employees working in a factory

Wages (Rs.):	55	65	75	85	95	105	115
No. of employees :	8	10	6	14	10	5	2

- b) Write the formula for calculating Mode, Median in continuous series.