Roll No. | | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 07

B.Sc.(IT) (2015 & Onwards)/BCA (2014 to 2018) (Sem.–2)

MATHEMATICS – II

Subject Code : BSIT/BSBC-202

M.Code : 10051

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) Define Diagonal and Non-singular matrices.

b) Find rank of matrix $\begin{bmatrix} 1 & 1 & 1 \\ 1 & -1 & -1 \\ 3 & 1 & 1 \end{bmatrix}$.

c) Discuss various measure of central tendency.

d) Define various types of Annuities.

e) If $y = x^2 \sin x$, find $\frac{dy}{dx}$.

f) Find derivative of $x^2 + \frac{\pi}{2} - \sqrt{x}$.

g) Solve $\int xe^{x^2} dx$

h) Differentiate $\frac{ax+b}{cx+d}$.

i) Differentiate $(\sin x + \cos x)^2$

j) Define trapezoidal rule.

SECTION-B

2. a) The frequen**cy distribution**

X :	A	2A	3A	4A	5A	6A
F :	2	1	1	1	1	1

Where A is a positive integer, has a variance of 160. Determine the value of A.

b) Mean and standard deviation of 100 items are 50 and 4, respectively. Find the sum of all the items and the sum of the square of the items.

3. a) If $\begin{bmatrix} xy & 4 \\ z+6 & x+y \end{bmatrix} = \begin{bmatrix} 8 & w \\ 0 & 6 \end{bmatrix}$, then find values of x, y, z and w.

b) Using matrix method, solve $3x + 2y - 2z = 3$, $x + 2y + 3z = 6$, $2x - y + z = 2$.

4. a) Differentiate $(\sin x)^{\cos x}$.

b) An open box with square base is to be made of a given quantity of a card board area c^2. Show that maximum volume of the box is $\frac{c^3}{6\sqrt{3}}$.

5. a) Evaluate $\int \frac{x\,dx}{\sqrt{x^4-1}}$.

b) Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using Simpson's $\frac{1}{3}$ rule taking $h = \frac{1}{4}$.

6. a) Find inverse of $\begin{bmatrix} 1 & 2 & 0 \\ -2 & -1 & -2 \\ 0 & 1 & -1 \end{bmatrix}$.

b) Suppose you deposit Rs. 900 per month into an account that pays 4.8% interest, compounded monthly. How much money will you have after 9 months?

7. a) Differentiate $e^{2x+3}(x^2 - 1)\sin x^2$.

b) Evaluate $\int_0^1 x \log(1+2x)\,dx$.

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.