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

Total No. of Questions : 09

B.Voc. (Solar System Technology) (Sem.–1)

BASICS OF MATHEMATICS

Subject Code : SST.101

M.Code : 91548

Date of Examination : 08-12-2023

Time : 3 Hrs. **Max. Marks : 30**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.**
2. **SECTION-B contains FIVE questions carrying TWO AND A HALF marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying FIVE marks each and students have to attempt any TWO questions.**

SECTION-A

1. Write briefly :

a) Find the value of x for which the functions f(x) = $\sqrt{(x-1)(x-3)}$ not defined.

b) Find the values of a,b,c and d from the equation.

$$\begin{bmatrix} a-b & 2a+c \\ 2a-b & 3c+d \end{bmatrix} = \begin{bmatrix} -1 & 5 \\ 0 & 13 \end{bmatrix}$$

c) Find the derivative of Y= $(x+1)^2 (x^2+1)^{-3}$ w.r.t x

d) Evaluate $\int \frac{1}{x(x^n+1)}$ dx

e) Find the value of $\sqrt{3}$ cosec 20° – sec20°

f) Find the value of tan 15°

g) Define continuity of the function with an example.

h) Discuss the concept of elementary row and column operations I matrix algebra

i) Evaluate $\int\left(\sqrt{x}-\frac{1}{2}+\frac{2}{\sqrt{x}}\right)dx$

j) Find the limit of the function f(x)= $\frac{x^3-27}{x-3}$ as x approaches to 3.

SECTION -B

2. If A = $\begin{bmatrix} 2 & -1 \\ -1 & 3 \end{bmatrix}$ and B = $\begin{bmatrix} 1 & 4 \\ -1 & 1 \end{bmatrix}$ Does $(A + B)^2 = A^2 + B^2 + 2AB$ hold.

3. Every differential function is continuous but a continuous function may not be differentiable. Do you agree with the statement?

4. Evaluate $\int\frac{1}{x^2+5x+6}dx$

5. Find the Rank of the matrix A= $\begin{bmatrix} 0 & 6 & 6 \\ -8 & 7 & 2 \\ -2 & 3 & 0 \end{bmatrix}$

6. If x = y(1+log) then show that $\frac{dy}{dx} = \frac{\log x}{dx(1+\log x)^2}$

SECTION-C

7. Find the values of the circle in which a central angle of 60° intercepts an arc of length 37.4 cm.

8. Matrix A= $\begin{bmatrix} 0 & 2b & -2 \\ 3 & 1 & 3 \\ 3a & 3 & -1 \end{bmatrix}$ is given to be symmetric matrix then find the value of a and b

9. Evaluate $\int_0^1\frac{x^2+1}{(2x-1)(x+1)(x-1)}$ dx

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