Activity/Experiment No. .....

Objective HOLIDAY HOMEWORK XII MATHS

1 Make a Formula notes of (Part-I + Part II)

2. Evaluate (I) $\int_{-1}^{2} |x^3 - 3x^2 + 2x| dx$ (II) $\int \sin^{-1}\sqrt{\frac{x}{a+x}}\, dx$

3. Solve the differential Equations

(I) $(1+x^2)\frac{dy}{dx} + 2xy - 4x^2 = 0$ where $y(0) = 0$

(II) $ye^{\frac{x}{y}}\, dx = (x \cdot e^{\frac{x}{y}} + y^2)\, dy \quad (y \neq 0)$

4 Show that the line $\frac{x+1}{3} = \frac{y+3}{5} = \frac{z+5}{7}$ and $\frac{x-2}{1} = \frac{y-4}{3} = \frac{z-6}{5}$ intersects. Also find point of intersection.

5 Evaluate the product AB, where

$$A = \begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix} \text{ and } B = \begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix}$$

Hence solve the system of linear equations

$x - y = 3$

$2x + 3y + 4z = 17$

$y + 2z = 7$

TEACHER'S SIGNATURE

Q:-6 Let $A=\{1,2,3,\ldots,9\}$ and R be the relation in $A\times A$ defined by $(a,b)R(c,d)$ if $a+d=b+c$ for $(a,b),(c,d)$ in $A\times A$. Prove that R is an equivalence relation and also obtain the equivalence class $[(2,5)]$.

Q:-7 If $f(x)=3x^4+4x^3-12x^2+12 \quad -3\le x\le 3$

(I) Is this function differentiable in $(-3,3)$?

(II) Find the Critical Points

(III) Find the Intervals in which the function strictly Inc(↑) & Dec(↓)

(IV) Find the Points of local maxima/local minima of the function as well as the points of absolute maxima/absolute minima in the interval $[-3,3]$. Also find the Corresponding local maximum / local minimum and the absolute maximum, absolute minimum.

Q:-8 Find the the equation of line which intersects the lines $\frac{x+2}{1}=\frac{y-3}{2}=\frac{z+1}{4}$ and $\frac{x-1}{2}=\frac{y-2}{3}=\frac{z-3}{4}$ and passes through the point $(1,1,1)$

Q:-9 If $\vec{a}$ & $\vec{b}$ are unit vectors and θ is the angle between them then prove that $\sin\frac{\theta}{2}=\frac{1}{2}|\vec{a}-\vec{b}|$

Q:-10 Find the area bounded by the curve $x^2=4y$ and the straight line $x=4y-2$

Q:-11 Show that the volume of the greatest Cylinder that can be inscribed in a Cone of height 'h' and the semi-vertical angle 'α' is $\frac{4}{27}\cdot\pi h^3\tan^2\alpha$

Note:- Solve 2 CBSE Sample Papers of session -2023-24.