D.A.V. PUBLIC SCHOOL, CRRC, Medical Road, Gaya

Sunday Test (Date – 03rd Dec. 2023)

Class – XII **Time : 40 Min**
Sub. – Mathematics **F.M. - 20**

Section – A (2x5 =10 marks)

1. Find the area bounded by y=x^2, x – axis and lines x =-1 and x=1.
2. Show that for any two non – zero vectors $\vec{a}$ and $\vec{b}$, $|\vec{a}+\vec{b}|$ =$|\vec{a}-\vec{b}|$ iff $\vec{a}$ and $\vec{b}$ are perpendicular vectors.
3. Find $|\vec{x}|$, if for a unit vector $\vec{a}$, $(\vec{x}-\vec{a}).(\vec{x}+\vec{a})$ = 12.
4. Find the area of the parallelogram whose adjacent sides are determined by the vectors $\vec{a}$ = $\hat{\imath}$-$\hat{\jmath}$+3$\hat{k}$ and $\vec{b}$=2$\hat{\imath}$-7$\hat{\jmath}$+$\hat{k}$.
5. Write the projection of the vector ($\vec{b}$+$\vec{c}$) on the vector $\vec{a}$, where $\vec{a}$ = 2$\hat{\imath}$ - 2$\hat{\jmath}$ + $\hat{k}$, $\vec{b}$ = $\hat{\imath}$ + 2$\hat{\jmath}$ - 2$\hat{k}$ and $\vec{c}$=2$\hat{\imath}$-$\hat{\jmath}$+4$\hat{k}$.

Section – B (5x2=10marks)

6. Using integration, find the area of $\{(x,y): x^2+y^2 \leq 9, x+y \geq 3\}$.
7. Let $\vec{a}$ = $\hat{\imath}$+4$\hat{\jmath}$+2$\hat{k}$, $\vec{b}$ = 3$\hat{\imath}$-2$\hat{\jmath}$+7$\hat{k}$ and $\vec{c}$ = 2$\hat{\imath}$-$\hat{\jmath}$+4$\hat{k}$.Find a vector $\vec{d}$ which is perpendicular to both $\vec{a}$ and $\vec{b}$, and $\vec{c}.\vec{d}$ =15.