Class XII **VECTOR ALGEBRA** **Assignment No. 10**

Q1. Find the magnitude of each of the following vectors :-

(i) $\vec{a} = \hat{i} + 2\hat{j} + 5\hat{k}$ (ii) $\vec{b} = 3\hat{i} + 4\hat{j} - 3\hat{k}$ (iii) $\vec{c} = \frac{1}{\sqrt{3}}\hat{i} - \frac{1}{\sqrt{3}}\hat{j} + \frac{1}{\sqrt{3}}\hat{k}$

Q2. Find the unit vector in the direction of :-

(i) $\vec{a} = \hat{i}3 + 4\hat{j} - 5\hat{k}$ (ii) direction of AB if A (-2, 1, 2) & B (2, -1)

Q3. Find a vector in the direction of $\vec{a} = \hat{i}6 - 2\hat{j} + 3\hat{k}$ whose magnitude is 4 units.

Q4. Find direction ratios and direction cosins of $\vec{a} = 5\hat{i} - 3\hat{j} + 4\hat{k}$

Q5. Find the angel between the vectors $\vec{a} = (3\hat{i} - 2\hat{j} + \hat{k}$ & $\vec{b} = \hat{i} - 2\hat{j} - 3\hat{k}$

Q6. Find x for which vectors $\vec{a} = 3\hat{i} + \hat{j} - 2\hat{k}$ + $\vec{b} = \hat{i} + \lambda\hat{j} - 3\hat{k}$ are perpendicular to each other.

Q7. Find the projection of $\vec{a} = 2\hat{i} - \hat{j} + \hat{k}$ on $\vec{b} = \hat{i} - 2\hat{j} + \hat{k}$

Q8. Find a vector with magnitude 3 units & is perpendicular to each of the vector $\vec{a} = 3\hat{i} + \hat{j} - 4\hat{k}$ and $\vec{b} = 6\hat{i} + 5\hat{j} - 2\hat{k}$

Q9. Find ($\vec{a}x\overline{b}$) and I $\vec{a}x\overline{b}$ I if (i) $\vec{a} = \hat{i} - \hat{j} + 2\hat{k}$ & $\vec{b} = 2\hat{i} + 3\hat{j} - 4\hat{k}$

(ii) $\vec{a} = 2\hat{i} + \hat{j} + 3\hat{k}$ & $\vec{b} = 3\hat{i} + 5\hat{j} - 2\hat{k}$ (iii) $\vec{a} = 3\hat{i} + 5\hat{j} - 2\hat{k}$ & $\vec{b} = 3\hat{i} + \hat{k}$

Q10. Find the area of parallelogram whose diagonal are (i) $\vec{d}1 = 3\hat{i} + \hat{j} - 2\hat{k}$ & $\vec{d}2 = \hat{i} - 3\hat{j} + 4\hat{k}$

(ii) $\vec{d}1 = 2\hat{i} - \hat{j} + \hat{k}$ & $\vec{d}2 = 3\hat{i} + 4\hat{j} - \hat{k}$

Q11. Using Vector find area of Δ ABC if :-

(i) A (3, -1, 2), B (1, -1, -3) & C (4, -3) (ii) A(1,2,3), B(2, 5, -1), C (-1, 1, 2)

Q12. Using vector show A, B, C are collinear pts.

(ii) A (3, -5, 1), B(-1, -, 8) & C (7, -10, -6) (ii) A(6, -7, -1) B(2, -3, 1) & C (4, -5, 0)

Q13. Verify $\vec{a}x(\vec{b} + \vec{c}) + (\vec{a}x\overline{b}) + (\vec{a}x\vec{c})if$

(i) $\vec{a} = \hat{i} - \hat{j} - 3\hat{k}$, $\overline{b} = 4\hat{i} - 3\hat{j} + \hat{k}$ and $\vec{c} = 2\hat{i} - \hat{j} + 2\hat{k}$

(ii) $\vec{a} = 4\hat{i} - \hat{j} - \hat{k}$, $\overline{b} = \hat{i} - \hat{j} + \hat{k}$ and $\vec{c} = 2\hat{i} - \hat{j} + 2\hat{k}$

Q14. If I $\vec{a}$ I = 5, I $\vec{b}$ I = 13, and ($\vec{a}x\vec{b}$) = 25, find $\vec{a}$, $\vec{b}$

Q15. If I $\vec{a}$ I = 2, I $\vec{b}$ I = 7, and ($\vec{a}x\vec{b}$) = $3\hat{i} + 2\hat{j} + 6\hat{k}$, find the angle between $\vec{a}$ and $\vec{b}$.