

By. Er. Dharmendra Sir

7974073108, 9584873492

# DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

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**TEST - PAPER (CBSE/NCERT)**

**VECTOR ALGEBRA**

**SESSION -2024-25**

**CLASS - 12<sup>th</sup>**

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Time : 1 hr

∴ Vector algebra :-

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Q. 1. A vector  $\vec{r}$  is inclined at equal angles to the three axes. If the magnitude of  $\vec{r}$  is  $2\sqrt{3}$  units, then find the value of  $\vec{r}$ .

Q. 2. If a vector  $\vec{r}$  has magnitude 14 and direction ratio 2, 3 and -6, then, find the direction cosines and components of  $\vec{r}$ , given that  $\vec{r}$  makes an acute angle with x-axis.



Q. 3. If  $\vec{a} + \vec{b} + \vec{c} = 0$  then show that  $\vec{a} \times \vec{b} = \vec{b} \times \vec{c} = \vec{c} \times \vec{a}$ , Interpret the result geometrically.

Q. 4. Find the sine of the angle between the vectors

$$\vec{a} = 3\hat{i} + \hat{j} + 2\hat{k} \text{ and } \vec{b} = 2\hat{i} - 2\hat{j} + 4\hat{k}$$



Q. 5. using vectors, find the area of the  $\Delta ABC$  with vertices  $A(1, 2, 3)$ ,  $B(2, -1, 4)$  and  $C(4, 5, -1)$

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Q.6. Using vectors, prove that the parallelogram on the same base and between the same parallels are equal in area.

Q.7. If  $\vec{a} = \hat{i} - \hat{j} + \hat{k}$  and  $\vec{b} = \hat{j} - \hat{k}$ , then find a vector  $\vec{c}$  such that  $\vec{a} \times \vec{c} = \vec{b}$  and  $\vec{a} \cdot \vec{c} = 3$ .

Q.8. The value of  $\lambda$  for the vectors  $3\hat{i} - 6\hat{j} + \hat{k}$  and  $2\hat{i} - 4\hat{j} + \lambda\hat{k}$  are parallel.



Q.9. The vectors from origin to the points A and B are  $\vec{a} = 2\hat{i} - 3\hat{j} + 2\hat{k}$  and  $\vec{b} = 2\hat{i} + 3\hat{j} + \hat{k}$  respectively. then the area of  $\Delta OAB$ .

Q.10. If  $|\vec{a}| = 10$ ,  $|\vec{b}| = 2$  and  $\vec{a} \cdot \vec{b} = 12$ , then the value of  $|\vec{a} \times \vec{b}|$  is



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