

Class – XI

Chapter - Vector



Date - 24.06.20

Topic -Direction cosine and unit vector

Choose the correct option for the following questions.

- 1. Chose the correct option
  - a. Only the magnitudes of  $\hat{i}$ ,  $\hat{j}$  and  $\hat{k}$  are 1.
  - b. Magnitude of unit vector of any vector is 1
  - c. Magnitude of any vector is 1
  - d. None of these
- 2. The vector joining two points (0, 3) and (-3, 0) is
  - a.  $-3\hat{i} + 3\hat{j}$
  - b.  $3\hat{i} 3\hat{j}$
  - c.  $-3\hat{j}$
  - d.  $-3\hat{i} 3\hat{j}$
- 3. The unit vector of  $\overrightarrow{PQ}$ , where the coordinates are P(1,2) and Q(2, -1) is
  - $\frac{\hat{\iota}-3\hat{j}}{10}$ a.

  - b.  $\frac{\hat{i}-3\hat{j}}{-8}$

c. 
$$\frac{l-3j}{\sqrt{10}}$$

d.  $\sqrt{10}(\hat{\imath} - 3\hat{\jmath})$ 

4. The coordinates of two points are given as A (-1, 2, 2) and B(2, -1, -1). The vector  $\overrightarrow{BA}$  will be then –

- a.  $3\hat{i} 3\hat{j} 3\hat{k}$
- b.  $3\hat{i} + 3\hat{j} 2\hat{k}$
- c.  $-3\hat{\imath} + 3\hat{\jmath} + 3\hat{k}$
- d.  $-3\hat{\imath} + 3\hat{\jmath} 3\hat{k}$
- 5. The unit vector of the vector  $\hat{i} + \hat{j} + \hat{k}$  is –

a. 
$$\hat{\imath} + \hat{\jmath} + \hat{k}$$

- b.  $\frac{1}{3}(\hat{\imath}+\hat{\jmath}+\hat{k})$
- c.  $\frac{1}{\sqrt{3}}(\hat{\imath}+\hat{\jmath}+\hat{k})$
- d. None of these

 $1 \times 15 = 15$ 

- 6. A constant vector makes 30° and 60° angles with X axis and Y axis respectively. What angle it makes with the Z axis?
  - a. 0°
  - b. 45°
  - c. 60°
  - d. 90°
- 7. Two forces  $3\hat{i} \hat{j} 2\hat{k}$  N and  $-3\hat{i} + \hat{j} 3\hat{k}$  N acts simultaneously on a body. The net force on the body is a. 5 N along - ve Z - axis
  - b. 5 N along + ve Z axis
  - c.  $6\hat{i} 2\hat{j} + \hat{k} N$
  - d. None of these
- 8. The direction cosines of the position vector of the point (1, 2, -3) is –

a. 
$$\frac{1}{\sqrt{14}}, \frac{2}{\sqrt{14}}, \frac{-3}{\sqrt{14}}$$
  
b.  $\cos\left(\frac{1}{\sqrt{14}}\right), \cos\left(\frac{2}{\sqrt{14}}\right), \cos\left(\frac{-3}{\sqrt{14}}\right)$   
c.  $1, 2, -3$   
d.  $\frac{1}{\sqrt{14}}, \frac{2}{\sqrt{14}}, \frac{3}{\sqrt{14}}$ 

- 9. What are the angles made by the vector  $\hat{i} + \hat{j} + \sqrt{2}\hat{k}$  with X, Y and Z axis respectively?
  - a. 60°, 60°, 60°
  - b. 60°, 45°, 60°
  - c. 45°, 60°, 60°
  - d. 60°, 60°, 45°

10. The vector of magnitude 9 unit along the direction of the vector  $\hat{i} + 2\hat{j} - 2\hat{k}$  is –

- a.  $9(\hat{\imath} + 2\hat{\jmath} 2\hat{k})$
- b.  $\sqrt{9}(\hat{\imath} + 2\hat{\jmath} 2\hat{k})$
- c.  $\frac{1}{\sqrt{9}}(\hat{\imath}+2\hat{\jmath}-2\hat{k})$
- d.  $9\sqrt{9}(\hat{\imath}+2\hat{\jmath}-2\hat{k})$

11. Three unit vectors  $\hat{a}_1$ ,  $\hat{a}_2$  and  $\hat{a}_3$  are such that ,  $\hat{a}_1 + \hat{a}_2 + \hat{a}_3 = \vec{0}$ . Then the angle between  $\hat{a}_1$  and  $\hat{a}_2$  can be –

- a. 30°
- b. 60°
- c. 90°
- d. 120°

12. A vector of magnitude 5unit is perpendicular to the Y – axis. Then the vector can be –

- a.  $3\hat{i} + 4\hat{j}$
- b. 5î
- c.  $-5\hat{\imath}$
- d. Both b. and c.

- 13. Choose the correct option
  - a. The unit vector of all the vectors of any magnitude along a particular direction are equal
  - b. The unit vector of all the vectors of any magnitude along a particular direction are different
  - c. The unit vector of a vector and its reverse vector are same
  - d. None of these

14. A vector lies in XY plane and makes 45° with +ve X-axis. Its unit vector will be -

- a.  $\hat{\iota} + \hat{j}$
- b.  $\frac{1}{\sqrt{2}}(\hat{\imath}+\hat{j})$
- c.  $\sqrt{2}(\hat{\imath} + \hat{\jmath})$
- d. Cannot be predicted without the actual vector.
- 15. For two non zero vectors  $\vec{P}$  and  $\vec{Q}$  of unequal magnitudes,  $|\vec{P} + \vec{Q}| = |\vec{P} \vec{Q}|$ . What is the angle between two vectors?
  - a. 0°
  - b. 30°
  - c. 45°
  - d. 90°

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