

CHAPTER: 2 VECTORS: [EXAM MODEL QUESTIONS]

MCQs:

1. Which of the sets give below may represent the magnitudes of three vectors adding to be zero?
 - a. 2, 4, 8
 - b. 4, 8, 16
 - c. 1, 2, 1
 - d. 0.5, 1, 2
2. A vector is not changed if:
 - a. It is rotated through an arbitrary angle.
 - b. It is multiplied by an arbitrary scalar
 - c. It is cross multiplied by a unit vector
 - d. It is shifted parallel to itself
3. If $\vec{P} \cdot \vec{Q} = |\vec{P} \times \vec{Q}|$, the angle between \vec{P} and \vec{Q} is,
 - a. 0
 - b. $\pi/2$
 - c. $\pi/4$
 - d. π
4. The resultant of \vec{A} and \vec{B} makes an angle α with \vec{A} and β with \vec{B} .
 - a. $\alpha < \beta$
 - b. $\alpha < \beta$ if $A < B$
 - c. $\alpha < \beta$ if $A > B$
 - d. $\alpha < \beta$ if $A = B$
5. If $\vec{P} \cdot \vec{Q} = 0$, the angle between \vec{P} and \vec{Q} is
 - a. 0
 - b. $\pi/2$
 - c. $\pi/4$
 - d. π
6. The resultant magnitude of two vector will be maximum, if angle between them is,
 - a. 0
 - b. $\pi/2$
 - c. $\pi/4$
 - d. π
7. What is the angle between $\vec{P} \times \vec{Q}$ and $\vec{Q} \times \vec{P}$
 - a. 0
 - b. $\pi/2$
 - c. $\pi/4$
 - d. π
8. What is the angle between $\vec{P} \times \vec{Q}$ and $\vec{P} + \vec{Q}$
 - a. 0
 - b. $\pi/2$
 - c. $\pi/4$
 - d. π
9. If \vec{A} , \vec{B} and \vec{C} have magnitude 6, 8 and 10 respectively, and $\vec{A} + \vec{B} = \vec{C}$, angle between A and B is,
 - a. 0
 - b. 45
 - c. 90
 - d. 180
10. A force of $(3\hat{i} + 4\hat{j})N$ acts on a body and displaces it by $(3\hat{i} + 4\hat{j})m$. The work done by the forces is,
 - a. 10 J
 - b. 12 J
 - c. 16 J
 - d. 25 J
11. A force $(3\hat{i} + c\hat{j} + 2\hat{k})N$ acting on a particle causes displacement of $(-4\hat{i} + 2\hat{j} + 3\hat{k})m$ in its own direction. If work done is 6 J, then value of 'c' is,
 - a. 0
 - b. 1
 - c. 6
 - d. 12
12. Three vectors satisfy the relation $\vec{A} \cdot \vec{B} = 0$ and $\vec{A} \cdot \vec{C} = 0$, then A is parallel to,
 - a. $\vec{B} \times \vec{C}$
 - b. $\vec{B} \cdot \vec{C}$
 - c. \vec{C}
 - d. \vec{B}
13. The value of $\hat{i} \cdot (\hat{j} \times \hat{k})$ is,
 - a. 1
 - b. 0
 - c. \hat{j}
 - d. \hat{k}
14. Two vectors $\vec{A} = 5\hat{i} + 7\hat{j} - 3\hat{k}$ and $\vec{B} = 2\hat{i} + 2\hat{j} - a\hat{k}$ are perpendicular to each other, then the value of a is,
 - a. 12
 - b. -12
 - c. 8
 - d. -8
15. If $\vec{P} \cdot \vec{Q} = |\vec{P} \times \vec{Q}|$, then $|\vec{P} + \vec{Q}|$,
 - a. $A + B$
 - b. $A - B$
 - c. $\sqrt{A^2 + B^2 + \sqrt{2}AB}$
 - d. zero
16. Two forces of magnitude F have resultant of same magnitude F. Angle between two forces is,
 - a. 45°
 - b. 120°
 - c. 150°
 - d. 180°

SAQs {5 marks type questions}

1. a. A vector has both magnitude and direction does it mean that anything that has magnitude and direction is necessarily a vector? Explain with example.
 - b. If $\vec{A} = 4\hat{i} - \hat{j} + 3\hat{k}$ and $\vec{B} = 7\hat{i} + 5\hat{j} + \hat{k}$:
 - i. Find the unit vector of vector \vec{A} .
 - ii. Find scalar product (Dot product) of \vec{A} and \vec{B}
 - iii. Find the angle between vector \vec{A} and \vec{B} .
 - iv. Find vector product (Cross Product) of \vec{A} and \vec{B}
 - v. Find the magnitude of $2\vec{A} + 3\vec{B}$