

CHAPTER: 2 VECTORS: [EXAM MODEL QUESTIONS]

MCQs:

1. 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
2. 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
------	------------	------------	----------
3. 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 $A = B$
---------------------	--------------------------------	--------------------------------	--------------------------------
4. 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
------	------------	------------	----------
5. The resultant magnitude of two vector will be maximum, if angle between them is,

a. 0	b. $\pi/2$	c. $\pi/4$	d. π
------	------------	------------	----------
6. 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
------	------------	------------	----------
7. 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
------	------------	------------	----------
8. 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
------	-------	-------	--------
9. 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
---------	---------	---------	---------
10. 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
------	------	------	-------
11. 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}
-----------------------------	----------------------------	--------------	--------------
12. The value of $\hat{i} \cdot (\hat{j} \times \hat{k})$ is,

a. 1	b. 0	c. \hat{j}	d. \hat{k}
------	------	--------------	--------------
13. 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
-------	--------	------	-------
14. 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
------------	------------	------------------------------------	---------
15. 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

- 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 $2\vec{A} + 3\vec{B}$