

Objective Type Questions & Answers

Select the best answer for the following MCQs:

1) Which of the following is dimensionless quantity:

- (a) displacement (b) impulse (c) work (d) angle

2) An example of scalar quantity is,

- (a) torque (b) velocity (c) energy (d) acceleration

3) A unit vector represents,

- (a) magnitude of a vector (b) direction of a vector
(c) neither magnitude nor direction (d) none of these

4) The angle between two rectangular components of any vector is,

- (a) 30° (b) 60° (c) 90° (d) 120°

5) The position vector of a point in (X-Z) plane is given by.

- (a) $\vec{r} = y\hat{i} + z\hat{k}$ (b) $\vec{r} = y\hat{i} + z\hat{k}$
(c) $\vec{r} = x\hat{i} + z\hat{k}$ (d) $\vec{r} = x\hat{i} + z\hat{k}$

6) If the resultant of two forces each of magnitude F is also B , then angle between them is.

- (a) 0° (b) 30° (c) 60° (d) 120°

7) The minimum number of an equal forces whose vector sum can be zero is.

- (a) 1 (b) 2 (c) 3 (d) 4

8) If a force of 10 N makes an angle of 30° with-x-axis. Its y-component is given by.

- (a) 0N (b) 5 N (c) 8.66 N (d) 7.07 N

9) Two forces each of 10 N magnitude act on a body. If the forces are inclined at 30° and 60° with x-axis, then the x-component of their resultant is.

- (a) 10 N (b) 20 N (c) 13.66N (d) 1.366 N

10) The resultant of two forces 5 N and 12 N making an angle 90° with each other is.

- (a) 17 N (b) 7N (c) 13N (d) 15N

11) The angle between the two vectors $\vec{A} = 5\hat{i} + \hat{j}$ & $\vec{B} = 3\hat{i} + 3\hat{j}$ is,

- (a) 30° (b) 45° (c) 52° (d) 60°

12) When $\vec{A} \cdot \vec{B} = 0$ then the two vectors are,

(a) perpendicular (b) parallel (c) anti-parallel (d) none of these

13) The dot product of vector A with itself $\vec{A} \cdot \vec{A}$ is equal to,

(a) $A/2$ (b) A (c) $2A$ (d) A^2

14) If $\vec{A} \cdot \vec{B} = \vec{B} \cdot \vec{A}$, the scalar product is,

(a) additive (b) associative (c) commutative (d) multiplicative

15) The cross product of two vectors \vec{F} with itself $\vec{F} \times \vec{F}$ is,

(a) 1 (b) F^2 (c) $2\vec{F}$ (d) zero

16) The magnitude of vector $\vec{A} = 2\hat{i} - 2\hat{j} + \hat{k}$ is,

(a) 1 (b) 2 (c) 3 (d) 5

17) The cross product of two vectors is a negative vector when the angle between them is,

(a) 0° (b) 90° (c) 180° (d) 270°

18) If $\vec{A} \times \vec{B} = \vec{C}$ points along z-axis, then the vector A and B, must be in,

(a) yz plane (b) zx plane (c) xy plane (d) xθ plane

19) Which of the following is correct,

(a) $\vec{A} \times \vec{B} = -\vec{B} \times \vec{A}$ (b) $\vec{A} \times \vec{B} = \vec{B} \times \vec{A}$ (c) $\vec{A} \times \vec{B} = \vec{B} - \vec{C}$ (d) $\vec{A} \times \vec{B} \neq \vec{B} \times \vec{A}$

20) The dot product $\hat{i} \cdot \hat{i} = \hat{j} \cdot \hat{j} = \hat{k} \cdot \hat{k}$ is equal to,

(a) 0 (b) -1 (c) 1 (d) 1²

21) The cross product $\hat{i} \times \hat{i} = \hat{j} \times \hat{j} = \hat{k} \times \hat{k}$ is equal to,

(a) 0 (b) -1 (c) 1 (d) -1

22) $(\hat{i} \times \hat{j}) \cdot (\hat{k})$ is equal to.

(a) k (b) k² (c) 1 (d) -1

23) The cross product of $\hat{k} \times \hat{j}$ is equal to,

(a) \hat{i} (b) $-\hat{i}$ (c) 1 (d) -1

24) The perpendicular distance between the line of action of force and axis of rotation is called.

(a) torque (b) moment arm (c) moment of a force (d) displacement

25) The torque has a zero value. If the angle between \vec{r} and \vec{F} is,

(a) 0° (b) 30° (c) 60° (d) 90°

26) The torque is also called as.

- (a) moment of a force (b) moment of inertia
(c) moment arm (d) angular velocity

27) Two equal and opposite forces acting on a body form a.

- (a) torque (b) couple (c) moment arm (d) linear momentum

28) A body will be in rotational equilibrium. If,

- (a) $\sum \vec{F} = 0$ (b) $\sum x = 0$ (c) $\sum \vec{P} = 0$ (d) $\sum \vec{P} = 0$

29) If $\vec{A} = 2\hat{i} + \hat{j} + 2\hat{k}$ then $|\vec{A}|$ is,

- (a) 0 (b) 3 (c) 5 (d) 9

30) Angular momentum of a particle when $\vec{r} = 4$ cm and $\vec{p} = 2$ N-sec and the angle between \vec{r} and \vec{p} is 30°

- (a) $2 \text{ kg m}^2 \text{ s}^{-1}$ (b) $4 \text{ kg m}^2 \text{ s}^{-1}$ (c) $8 \text{ kg m}^2 \text{ s}^{-1}$ (d) $12 \text{ kg m}^2 \text{ s}^{-1}$

