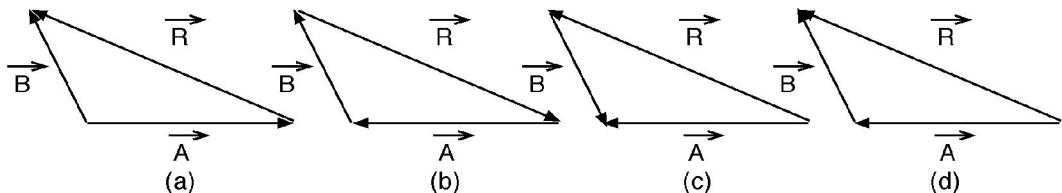


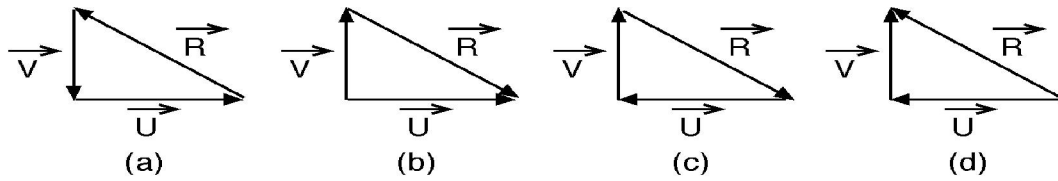
PHYSICS CHAPTER 2

1. **Which one of the followings is a scalar?**
 (a) Energy (b) Velocity
 (c) Force (d) Torque
2. **Which one of the followings is a vector?**
 (a) Length (b) Volume
 (c) Velocity (d) Work
3. **In which one of the followings are all the three quantities vectors?**
 (a) Displacement, velocity, energy
 (b) Force, work, energy
 (c) Displacement, velocity, momentum
 (d) Velocity, acceleration, power
4. **The reverse process of adding two vectors is called**
 (a) multiplication (b) subtraction
 (c) resolution (d) none of these
5. **The resultant of two vectors of equal magnitude inclined at some angle is equal to the magnitude of either of the two vectors. The angle between the two is**
 (a) 60° (b) 90°
 (c) 120° (d) 180°

6. **Tick the answer which is correct for $R = A + B$.**



7. **Which figure represents $R = U - V$?**



8. The result of adding \mathbf{A} into $-\mathbf{A}$ is
 (a) \mathbf{A} (b) $2\mathbf{A}$
 (c) $\mathbf{0}$ (d) 0
9. The unit vector of a vector \mathbf{A} is given by
 (a) $\hat{\mathbf{A}} = \mathbf{A} \mathbf{A}$ (b) $\hat{\mathbf{A}} = \frac{\mathbf{A}}{\mathbf{A}}$
 (c) $\hat{\mathbf{A}} = \frac{\mathbf{A}}{A}$ (d) $\hat{\mathbf{A}} = \frac{\mathbf{A}}{\sqrt{A}}$
10. When a certain vector is multiplied by -1 , then the direction of the vector changes through
 (a) 90° (b) 120°
 (c) 150° (d) 180°
11. Rectangular components make an angle of
 (a) 0° (b) 60°
 (c) 90° (d) 120°
12. The minimum number of unequal forces whose vector sum is zero must be
 (a) 1 (b) 2
 (c) 3 (d) 4
13. One of the rectangular components of a velocity of 50 ms^{-1} is 30 ms^{-1} . The other component in ms^{-1} is
 (a) 15 (b) 20
 (c) 25 (d) 40
14. For the two vectors $\mathbf{A}_x = (20 \text{ N}) \hat{\mathbf{i}}$, $\mathbf{A}_y = (20 \text{ N}) \hat{\mathbf{j}}$, the angle made by the resultant vector \mathbf{A} with the x-axis is
 (a) 45° (b) 135°
 (c) 215° (d) 315°
15. Which of the following forces cannot be added to give of a resultant of 2 N ?
 (a) 1 N and 1 N (b) 1 N and 2 N
 (c) $\sqrt{2} \text{ N}$ and $\sqrt{2} \text{ N}$ (d) 1 N and 3 N

16. Magnitude of the resultant of two vectors A_1 and A_2 inclined at an angle θ to each other is

(a) $R = \sqrt{A_1^2 + A_2^2 + 2A_1A_2 \cos \theta}$

(b) $R = \sqrt{A_1^2 - A_2^2 + 2A_1A_2 \cos \theta}$

(c) $R = \sqrt{A_1^2 + A_2^2 + 2A_1A_2 \sin \theta}$

(d) $R = \sqrt{A_1^2 + A_2^2 - 2A_1A_2 \sin \theta}$

17. Two forces act together on an object. The magnitude of their resultant is least when the angle between them is

(a) 45°

(b) 60°

(c) 90°

(d) 180°

18. If $|\mathbf{A} + \mathbf{B}| = |\mathbf{A} - \mathbf{B}|$ where \mathbf{A} and \mathbf{B} are two vectors of equal magnitudes, then the angle between \mathbf{A} and \mathbf{B} is

(a) 0°

(b) 60°

(c) 90°

(d) 180°

19. The angle subtended by $\mathbf{r} = 3\hat{\mathbf{i}} + 4\hat{\mathbf{j}}$ with x-axis is

(a) 53°

(b) 30°

(c) 41°

(d) 60°

20. The magnitude of a vector $\mathbf{A} = A_x\hat{\mathbf{i}} - A_y\hat{\mathbf{j}}$ is

(a) $A_x^2 + A_y^2$

(b) $\sqrt{A_x^2 + A_y^2}$

(c) $A_x^2 - A_y^2$

(d) $\sqrt{A_x^2 - A_y^2}$

21. The dot product of two non-zero vectors equals the product of their magnitudes only if the angle between them is

(a) 0°

(b) 90°

(c) 120°

(d) 180°

22. For which of the followings pair of angles, the dot product of two vectors is equal to the one half of the product of magnitudes of two vectors?
 (a) 60° and 120° (b) 60° and 240°
 (c) 60° and 300° (d) none of these
23. For a vector \mathbf{A} ,
 (a) $\mathbf{A} \cdot \mathbf{A} = 0$ (b) $\mathbf{A} \cdot \mathbf{A} = 1$
 (c) $\mathbf{A} \cdot \mathbf{A} = A$ (d) $\mathbf{A} \cdot \mathbf{A} = A^2$
24. Which one of the followings is correct?
 (a) $\hat{i} \cdot \hat{j} = \hat{k}$ (b) $\hat{i} \cdot \hat{j} = 0$
 (c) $\hat{i} \cdot \hat{j} = 1$ (d) $\hat{i} \cdot \hat{j} = -\hat{k}$
25. Given $\mathbf{A} = 2\hat{i} - 2\hat{j} + \hat{k}$, the magnitude of this vector is
 (a) 1 (b) 2
 (c) 3 (d) 5
26. If $\mathbf{A} \times \mathbf{B}$ lies along + z-axis, the vectors \mathbf{A} and \mathbf{B} will be in
 (a) xz-plane (b) xy-plane
 (c) yz-plane (d) x-direction only
27. The cross product of two non-zero parallel vectors \mathbf{A} and \mathbf{B} is
 (a) $AB \sin \theta$ (b) AB
 (c) $AB \sin \theta \hat{n}$ (d) \mathbf{O}
28. Which of the followings is incorrect?
 (a) $\hat{i} \times \hat{j} = \hat{k}$ (b) $\hat{k} \times \hat{j} = -\hat{i}$
 (c) $\hat{j} \times \hat{j} = 0$ (d) $\hat{i} \times \hat{j} = 0$
29. If $\mathbf{A} = A_x\hat{i} + A_y\hat{j}$ and $\mathbf{B} = B_x\hat{i} + B_y\hat{j}$ are two non-parallel vectors, then the direction of $\mathbf{A} \times \mathbf{B}$ is along
 (a) \mathbf{A} (b) \mathbf{B}
 (c) x-axis (d) z-axis

- 30. If $\mathbf{A} = A_1\hat{i} + A_2\hat{j}$ and $\mathbf{B} = B_1\hat{i} + B_2\hat{j}$, the number of components in the vector $\mathbf{A} \times \mathbf{B}$ is**
- (a) 1 only (b) 2 only
(c) 3 only (d) 4 only
- 31. If $\mathbf{A} \cdot \mathbf{B} = 0$ and $\mathbf{A} \times \mathbf{B} = \mathbf{0}$, then**
- (a) either \mathbf{A} or \mathbf{B} is a null vector.
(b) \mathbf{A} and \mathbf{B} are non-parallel.
(c) \mathbf{A} and \mathbf{B} are perpendicular to each other.
(d) \mathbf{A} and \mathbf{B} are parallel to each other.
- 32. The vector product is**
- (a) commutative (b) anticommutative
(c) associative (d) additive
- 33. The cross product of two vectors has a magnitude equal to the product of their magnitudes. Their dot product is equal to**
- (a) $AB \sin \theta$ (b) $AB \cos \theta$
(c) AB (d) 0
- 34. Torque produced by a force depends upon**
- (a) magnitude of the force and the angular velocity
(b) magnitude of the force and displacement
(c) magnitude of the force and moment arm
(d) force and acceleration of the body.
- 35. A couple consists of**
- (a) two equal and opposite forces acting at two different points on the body
(b) two equal and parallel forces acting at two different points
(c) two equal and opposite force acting at a point on the body
(d) two equal and parallel force acting at a point on the body.
- 36. The arm of a couple is**
- (a) any distance between the forces
(b) the shortest distance between the forces
(c) perpendicular distance between the two forces
(d) the longest distance between the two forces.

- 37. If the resultant of all the forces acting on a body is zero, then the body**
(a) has angular momentum (b) has acceleration
(c) is at rest (d) is in translational equilibrium
- 38. Three coplanar forces acting on a body keep it in equilibrium. The forces must be**
(a) collinear (b) concurrent
(c) non-concurrent (d) parallel
- 39. If the line of action of the force passes through the axis of rotation, then the torque is**
(a) zero (b) maximum
(c) clockwise in direction (d) counter clockwise in direction
- 40. $\hat{i} \times (\hat{j} \times \hat{k})$ equals**
(a) \hat{i} (b) \hat{k}
(c) 1 (d) $\mathbf{0}$

Key to Test Chapter 2

1	a	21	a
2	c	22	c
3	c	23	d
4	c	24	b
5	c	25	c
6	d	26	b
7	b	27	d
8	c	28	d
9	c	29	d
10	d	30	a
11	c	31	a
12	c	32	b
13	d	33	d
14	a	34	c
15	b	35	a
16	a	36	c
17	d	37	d
18	c	38	b
19	a	39	a
20	b	40	d