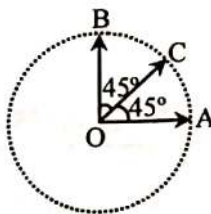


VECTOR

DPP-1

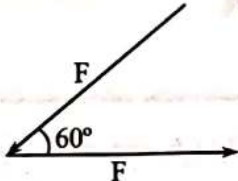
- Q.1 The angles which a vector $\hat{i} + \hat{j} + \sqrt{2}\hat{k}$ makes with X, Y and Z axes respectively are
 (A) $60^\circ, 60^\circ, 60^\circ$ (B) $45^\circ, 45^\circ, 45^\circ$ (C) $60^\circ, 60^\circ, 45^\circ$ (D) $45^\circ, 45^\circ, 60^\circ$
- Q.2 The resultant of $\vec{A} + \vec{B}$ is \vec{R}_1 . On reversing the vector \vec{B} , the resultant becomes \vec{R}_2 . What is the value of $R_1^2 + R_2^2$
 (A) $A^2 + B^2$ (B) $A^2 - B^2$ (C) $2(A^2 + B^2)$ (D) $2(A^2 - B^2)$
- Q.3 If $\vec{A} = 2\hat{i} + 3\hat{j} - \hat{k}$ and $\vec{B} = -\hat{i} + 3\hat{j} + 4\hat{k}$ then projection of \vec{A} on \vec{B} will be
 (A) $\frac{3}{\sqrt{13}}$ (B) $\frac{3}{\sqrt{26}}$ (C) $\sqrt{\frac{3}{26}}$ (D) $\sqrt{\frac{3}{13}}$
- Q.4 Two vectors $P = 2\hat{i} + b\hat{j} + 2\hat{k}$ and $Q = \hat{i} + \hat{j} + \hat{k}$ will be parallel if
 (A) $b = 0$ (B) $b = 1$ (C) $b = 2$ (D) $b = -4$
- Q.5 Which of the following is not true? If $\vec{A} = 3\hat{i} + 4\hat{j}$ and $\vec{B} = 6\hat{i} + 8\hat{j}$ where A and B are the magnitudes of \vec{A} and \vec{B}
 (A) $\vec{A} \times \vec{B} = 0$ (B) $\frac{A}{B} = \frac{1}{2}$ (C) $\vec{A} \cdot \vec{B} = 48$ (D) $A = 5$
- Q.6 The three vectors OA, OB and OC have the same magnitude R. Then the sum of these vectors have magnitude—



- (A) R (B) $\sqrt{2}R$ (C) 3R (D) $(1 + \sqrt{2})R$
- Q.7 \vec{A} , \vec{B} and \vec{C} are vectors each having a unit magnitude. If $\vec{A} + \vec{B} + \vec{C} = 0$, then $\vec{A} \cdot \vec{B} + \vec{B} \cdot \vec{C} + \vec{C} \cdot \vec{A}$ will be—
 (A) 1 (B) $-\frac{3}{2}$ (C) $-\frac{1}{2}$ (D) 0

Q.8 Given $\vec{C} = \vec{A} \times \vec{B}$ and $\vec{D} = \vec{B} \times \vec{A}$. What is the angle between \vec{C} and \vec{D} ?
 (A) 30° (B) 60° (C) 90° (D) 180°

Q.9 Two forces, each equal to F , act as shown in figure. Their resultant is -



- (A) $\frac{F}{2}$ (B) F (C) $\sqrt{3}F$ (D) $\sqrt{5}F$

Q.10 Two forces $F_1 = 3N$ at 0° and $F_2 = 5N$ at 60° act on a body. Then a single force that would balance the two forces must have a magnitude of-

- (A) $3N$ (B) $5N$ (C) $7N$ (D) $8N$



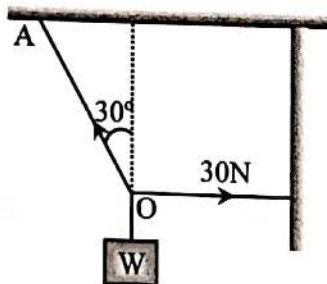
ANSWER KEY

1. (C) 2. (C) 3. (B) 4. (C) 5. (B) 6. (D) 7. (B)
 8. (D) 9. (B) 10. (C)

VECTOR

DPP-2

- Q.1** A unit vector perpendicular to $\vec{A} = 2\hat{i} + 3\hat{j} + \hat{k}$ and $\vec{B} = \hat{i} - \hat{j} + \hat{k}$ both is :
- (A) $\frac{1}{\sqrt{14}}(4\hat{i} - \hat{j} - 5\hat{k})$ (B) $\frac{1}{\sqrt{42}}(4\hat{i} - \hat{j} - 5\hat{k})$ (C) $\frac{1}{\sqrt{14}}(\hat{i} - \hat{j} + \hat{k})$ (D) $\frac{1}{\sqrt{42}}(2\hat{i} + 3\hat{j} + \hat{k})$
- Q.2** The maximum and minimum magnitudes of the resultant of two given vectors are 17 units and 7 units respectively. If these two vectors are at right angles to each other, the magnitude of their resultant is :
- (A) 14 (B) 16 (C) 18 (D) 13
- Q.3** If $\vec{A} = 4\hat{i} - 3\hat{j}$ and $\vec{B} = 6\hat{i} + 8\hat{j}$ then magnitude and direction of $\vec{A} + \vec{B}$ will be
- (A) 5, $\tan^{-1}(3/4)$ (B) $5\sqrt{5}$, $\tan^{-1}(1/2)$ (C) 10, $\tan^{-1}(5)$ (D) 25, $\tan^{-1}(3/4)$
- Q.4** Two forces of 12 N and 8N act upon a body. The resultant force on the body has maximum value of
- (A) 4 N (B) 0N (C) 20 N (D) 8 N
- Q.5** As shown in figure the tension in the horizontal cord is 30 N. The weight W and tension in the string OA in Newton are



- (A) $30\sqrt{3}$, 30 (B) $30\sqrt{3}$, 60 (C) $60\sqrt{3}$, 30 (D) None of these
- Q.6** A particle moves towards east with velocity 5 m/s. After 10 seconds its direction changes towards north with same velocity. The average acceleration of the particle is
- (A) Zero (B) $\frac{1}{\sqrt{2}}$ m/s² N-W (C) $\frac{1}{\sqrt{2}}$ m/s² N-E (D) $\frac{1}{\sqrt{2}}$ m/s² S-W
- Q.7** If \hat{i}, \hat{j} and \hat{k} represent unit vectors along the x, y and z-axis respectively, then angle θ between the vectors $\hat{i} + \hat{j} + \hat{k}$ and $\hat{i} + \hat{j}$ is equal to
- (A) $\sin^{-1}\left(\frac{1}{\sqrt{3}}\right)$ (B) $\sin^{-1}\left(\frac{\sqrt{2}}{\sqrt{3}}\right)$ (C) $\cos^{-1}\left(\frac{1}{\sqrt{3}}\right)$ (D) 90°

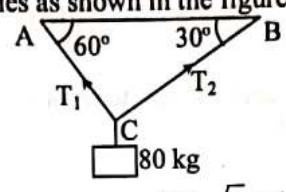
Q.8 A vector \vec{Q} which has a magnitude of 8 is added to the vector \vec{P} which lies along x-axis. The resultant of two vectors lies along y-axis and has magnitude twice that of P. The magnitude of \vec{P} is-

- (A) $\frac{6}{\sqrt{5}}$ (B) $\frac{8}{\sqrt{5}}$ (C) $\frac{12}{\sqrt{5}}$ (D) $\frac{16}{\sqrt{5}}$

Q.9 A force $\vec{F} = \hat{i} + \hat{j} + \hat{k}$ act on a body at point (1, 2, 3). Find the torque of force about point (6, -2, 1) -

- (A) $-2\hat{i} - 7\hat{j} + 9\hat{k}$ (B) $3\hat{i} + 4\hat{j} - 7\hat{k}$ (C) $2\hat{i} + 7\hat{j} + 9\hat{k}$ (D) $2\hat{i} - 7\hat{j} - 9\hat{k}$

Q.10 A mass 80kg is supported by two cables as shown in the figure. Then the ratio of tensions T_1 and T_2 is -



- (A) 1 : 1 (B) 1 : $\sqrt{3}$ (C) $\sqrt{3}$: 1 (D) 1 : 3

ANSWER KEY

1. (B) 2. (D) 3. (B) 4. (C) 5. (B) 6. (B) 7. (A)
 8. (B) 9. (A) 10. (C)