Yakeen NEET 2.0 2026

Physics

Vectors

DPP: 6

Q1 If $\vec{A} = 7\hat{i} - 2\hat{j} + 3\hat{k}$, what is the vector $-3\vec{A}$?
(A) $-21\hat{i} + 6\hat{j} - 9\hat{k}$
(B) $-7\hat{i} + 2\hat{j} - 3\hat{k}$
(C) $21\hat{i} - 6\hat{j} + 9\hat{k}$
(D) $-7\hat{i} + 6\hat{j} - 9\hat{k}$

Q2 Two vectors are given by $\vec{A} = \hat{i} + 2\hat{j} + 2\hat{k}$ and $\vec{B} = 3\hat{i} + 6\hat{j} + 2\hat{k}$. Another vector $\vec{C}$ has the same magnitude as $\vec{B}$ but has the same direction as $\vec{A}$. Then which of the following vectors represent $\vec{C}$
(A) $\frac{7}{3}(\hat{i} + 2\hat{j} + 2\hat{k})$
(B) $\frac{3}{7}(\hat{i} - 2\hat{j} + 2\hat{k})$
(C) $\frac{7}{9}(\hat{i} - 2\hat{j} + 2\hat{k})$
(D) $\frac{9}{7}(\hat{i} + 2\hat{j} + 2\hat{k})$

Q3 A unit vector parallel to the resultant of the vectors $\overrightarrow{\mathrm{A}} = 4\hat{\mathrm{i}} + 3\hat{\mathrm{j}} + 6\hat{\mathrm{k}}$ and $\overrightarrow{\mathrm{B}} = -\hat{\mathrm{i}} + 8\hat{\mathrm{j}} - 8\hat{\mathrm{k}}$
(A) $\frac{3\hat{\mathrm{i}}+11\hat{\mathrm{j}}-2\hat{\mathrm{k}}}{2}$
(B) $\frac{\hat{i}+2\hat{j}-3\hat{k}}{\sqrt{166}}$
(C) $\frac{3\hat{\mathrm{i}}+11\hat{\mathrm{j}}-2\hat{\mathrm{k}}}{\sqrt{134}}$
(D) $\frac{4\hat{\mathrm{i}}+6\hat{\mathrm{j}}+8\hat{\mathrm{k}}}{\sqrt{11}}$

Q4 Let $\overrightarrow{\mathrm{A}} = \hat{\mathrm{i}}\,\mathrm{A}\cos\theta + \hat{\mathrm{j}}\,\mathrm{A}\sin\theta$, be any vector. Another vector $\overrightarrow{\mathrm{B}}$ which is normal to $\vec{A}$ is:
(A) $\hat{\mathrm{i}}\,\mathrm{B}\cos\theta + \hat{\mathrm{j}}\,\mathrm{B}\sin\theta$
(B) $\hat{\mathrm{i}}\,\mathrm{B}\sin\theta + \hat{\mathrm{j}}\,\mathrm{B}\cos\theta$
(C) $\hat{\mathrm{i}}\,\mathrm{B}\sin\theta - \hat{\mathrm{j}}\,\mathrm{B}\cos\theta$
(D) $\hat{\mathrm{i}}\,\mathrm{A}\cos\theta - \hat{\mathrm{j}}\,\mathrm{A}\sin\theta$

Q5 When two vectors of magnitudes P and Q are inclined at an angle θ, the magnitude of their resultant $2P$. When the inclination is changed to $180 - \theta$, the magnitude of the resultant is halved. Find the ratio of P to Q.
(A) $\sqrt{2} : \sqrt{3}$
(B) $1 : \sqrt{3}$
(C) $1 : \sqrt{2}$
(D) $\sqrt{3} : \sqrt{2}$

Q6 If $\vec{r} = 0.2\hat{i} + a\hat{j} - 0.3\hat{k}$ is a unit vector, the value of a is
(A) $\sqrt{0.87}$
(B) 0.87
(C) 1.13
(D) $\sqrt{1.13}$

Q7 If $\hat{i}$, $\hat{j}$ and $\hat{k}$ represent unit vectors along the x, y and z axes respectively, then the 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) $\sin^{-1}\left(\sqrt{\frac{2}{3}}\right)$
(C) $\cos^{-1}\left(\frac{1}{\sqrt{3}}\right)$
(D) 90°

Q8 Two equal forces of magnitude 'A' act at a point inclined to each other at an angle of 60°. The magnitude of their resultant is:

(A) $\sqrt{3}A$ (B) 2A
(C) 3A (D) $\sqrt{2}A$

Q9 A unit vector parallel to the resultant of the vectors $\vec{A} = 4\hat{i} + 3\hat{j} + 6\hat{k}$ and $\vec{B} = -\hat{i} + 8\hat{j} - 8\hat{k}$

(A) $\frac{3\hat{i}+11\hat{j}-2\hat{k}}{2}$
(B) $\frac{\hat{i}+2\hat{j}-3\hat{k}}{\sqrt{166}}$
(C) $\frac{3\hat{i}+11\hat{j}-2\hat{k}}{\sqrt{134}}$
(D) $\frac{4\hat{i}+6\hat{j}+8\hat{k}}{\sqrt{11}}$

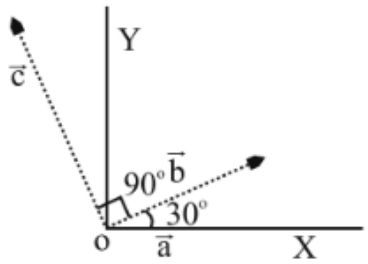
Q10 If $\vec{M} = 2\hat{i} - 3\hat{j}$ *and* $\vec{N} = 4\hat{i} + 7\hat{j}$ then match the columns $\left(\hat{i},\ \hat{j},\ \hat{k}\right)$ are unit vectors along X, Y and Z axis respectively

Column-I		Column-II	
(A)	$\vec{M} + 2\vec{N}$	P.	-78
(B)	$\vec{M} . 6\vec{N}$	Q.	$\sqrt{949}$
(c)	$1\vec{M} + 4\vec{N}$ (in unit)	R.	$26\hat{k}$
(D)	$\vec{M} \times \vec{N}$	S.	$10\hat{i} + 11\hat{j}$

A B C D
(1) P Q R S
(2) Q R P S
(3) S P Q R
(4) R S P P

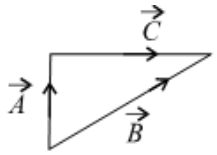
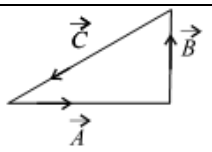
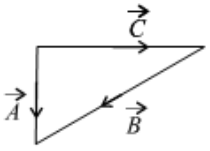
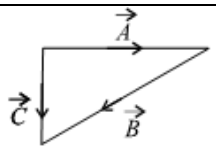
(A) 1 (B) 2
(C) 3 (D) 4

Q11 Three vectors as shown in the fig have magnitudes $\left|\vec{a}\right| = 3, \left|\vec{b}\right| = 4$ and $\left|\vec{c}\right| = 10.$ Find the numbers p and q such that $\vec{c} = p\vec{a} + q\vec{b}$.



(A) $-\frac{20}{3}, \frac{5\sqrt{3}}{2}$ (B) $\frac{20}{3}, \frac{5\sqrt{3}}{2}$
(C) $-\frac{10}{3}, \frac{\sqrt{3}}{2}$ (D) None of these

Q12 Match **List-I** with **List-II**.

List-I		List-II	
(A)	$\vec{C} - \vec{A} - \vec{B} = \vec{0}$	(I)	
(B)	$\vec{A} - \vec{C} - \vec{B} = \vec{0}$	(II)	
(C)	$\vec{B} - \vec{A} - \vec{C} = \vec{0}$	(III)	
(D)	$\vec{A} + \vec{B} = -\vec{C}$	(IV)	

Choose the **correct** answer from the options given below:
(A) A-I, B-IV, C-II, D-III
(B) A-IV, B-III, C-I, D-II
(C) A-III, B-II, C-IV, D-I
(D) A-IV, B-I, C-III, D-II

Answer Key

Q1	(A)
Q2	(A)
Q3	(C)
Q4	(C)
Q5	(A)
Q6	(A)
Q7	(A)
Q8	(A)
Q9	(C)
Q10	(C)
Q11	(A)
Q12	(B)