Yakeen NEET 2.0 2026

KPP-10

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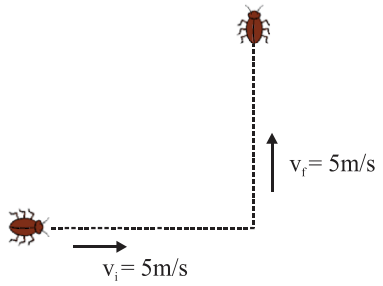
Vectors

ये questions module/sheets के as it is है | Solve them in 01 hour.

1. Find magnitude of change in velocity?



2. $\vec{A}=12\hat{i}+5\hat{j}$

Find (i) A_x (ii) A_y

(iii) $|\vec{A}|$, (iv) Angle of $\vec{A}$ from x-axis

(v) Angle of $\vec{A}$ from y-axis

(vi) Unit vector along $\vec{A}$

3. If $\vec{A}=0.6\hat{i}+b\hat{j}$ is a unit vector, find value of b.

(1) 0.8 (2) 0.7

(3) 0.6 (4) 0.3

4. A vector makes an angle of 30° with the horizontal. If the horizontal component of the vector is 250 N, find the magnitude of vector and its vertical component.

5. If $\vec{A}=\hat{i}+\hat{j}+\sqrt{2}k$, then find:

(i) A_x, A_y, A_z

(ii) $|\vec{A}|$

(iii) Direction cosines of $\vec{A}$

(iv) Angle of vector with x, y and z axis

6. $\vec{A}=\hat{i}+2\hat{j}+2\hat{k}$; $\vec{B}=3\hat{i}+\hat{j}+10\hat{k}$ then find:

(i) $\vec{R}$

(ii) $|\vec{R}|$

(iii) Unit vector parallel to resultant vector

(iv) Direction cosine of $\vec{R}$

7. $\vec{A}=\hat{i}-\hat{j}+2\hat{k}$; $\vec{B}=-2\hat{j}-\hat{k}$ then find unit vector parallel to $\vec{R}$ of $\vec{A}$ and $\vec{B}$.

8. Determine the vector which when added to the resultant of $\vec{P}$ and $\vec{Q}$, gives ZERO resultant (equilibrium). $\vec{P}=\hat{i}+2\hat{j}+\hat{k}$, $\vec{Q}=2\hat{i}-\hat{j}+2k$

9. Determine the vector which when added to the resultant of $\vec{P}$ and $\vec{Q}$, gives unit vector along x-axis where $\vec{P}=\hat{i}+2\hat{j}+k$, $\vec{Q}=2\hat{i}-\hat{j}+2k$.

(1) $-2\hat{i}+\hat{j}-3\hat{k}$ (2) $2\hat{i}+\hat{j}+3\hat{k}$

(3) $2\hat{i}-\hat{j}+3\hat{k}$ (4) $-2\hat{i}-\hat{j}-3\hat{k}$

10. Find angle between $\vec{A}$ and $\vec{B}$, if $\vec{A}(6N)$ and $\vec{B}(4N)$ and $\vec{A}\cdot\vec{B}=12$.

(1) 30° (2) 45°

(3) 60° (4) 75°

11. Find Work done if Force $\vec{F}=3\hat{i}+2\hat{j}+k$ and Displacement $\vec{s}=2\hat{i}-5\hat{j}+3k$.

(1) 1 J (2) –1 J

(3) 2 J (4) –2 J

12. Find Power if Force $\vec{F}=2\hat{i}-2\hat{j}+k$ and velocity $\vec{v}=3\hat{i}+2\hat{j}-k$.

(1) 5 W (2) 2 W

(3) 1 W (4) 0 W

13. Find angle between $\vec{A}=3\hat{i}+4\hat{j}$ and $\vec{B}=12\hat{i}-5\hat{j}$?

14. A force $\vec{F}=(3\hat{i}+4\hat{j})$N acts on a body and displaces it by $\vec{S}=(3\hat{i}+4\hat{j})$m. The work done $(W=\vec{F}\cdot\vec{S})$ by the force is:

(1) 10 J (2) 12 J

(3) 19 J (4) 25 J

15. What is the projection of $3\hat{i}+4\hat{k}$ on the *y*-axis?

(1) 3 (2) 4

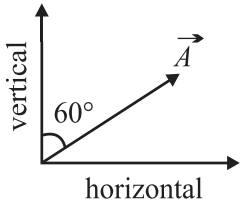
(3) 5 (4) zero

16. If $\vec{P}=3\hat{i}+4\hat{j}+12\hat{k}$ then find magnitude and the direction cosines of $\vec{P}$.

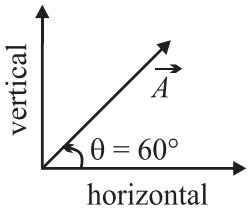
17. Find the angle made by $(\hat{i}+\hat{j})$ vector from *X* and *Y* axes respectively.

18. Find out the angle made by $\vec{A}=\hat{i}+\hat{j}+\hat{k}$ vector from *X*, *Y* and *Z* axes respectively.

19. A force of 4N is inclined at an angle of 60° from the vertical. Find out its components along horizontal and vertical directions.

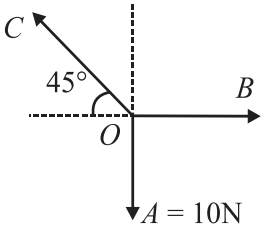


20. A force is inclined at an angle of 60° from the horizontal. If the horizontal component of the force is 40N, calculate the vertical component.

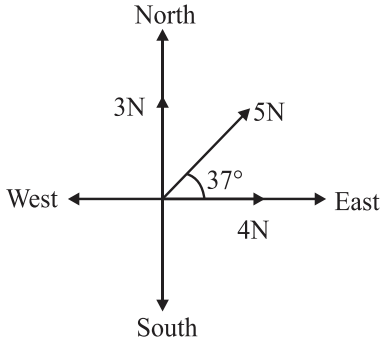


21. Determine that vector which when added to the resultant of $\vec{P}=2\hat{i}+7\hat{j}-10\hat{k}$ and $\vec{Q}=\hat{i}+2\hat{j}+3\hat{k}$ gives a unit vector along *X*-axis.

22. The sum of three vectors shown in figure, is zero. What is the magnitude of vector $\overrightarrow{OB}$ and $\overrightarrow{OC}$?



23. For shown situation, what will be the magnitude of minimum force in newton that can be applied in any direction so that the resultant force is along east direction?



24. If a unit vector is represented by $0.5\hat{i}-0.8\hat{j}+c\hat{k}$, then the value of '*c*' is:

(1) 1 (2) $\sqrt{0.11}$

(3) $\sqrt{0.01}$ (4) $\sqrt{0.39}$

25. Vector $\vec{P}$ makes angles α, β and γ with the *X*, *Y* and *Z*-axes respectively, then $\sin^2\alpha+\sin^2\beta+\sin^2\gamma=$

(1) 0 (2) 1

(3) 2 (4) 3

26. The direction cosines of a vector $\hat{i}+\hat{j}+\sqrt{2}\hat{k}$ are:

(1) $\frac{1}{2},\frac{1}{2},1$ (2) $\frac{1}{\sqrt{2}},\frac{1}{\sqrt{2}},\frac{1}{2}$

(3) $\frac{1}{2},\frac{1}{2},\frac{1}{\sqrt{2}}$ (4) $\frac{1}{\sqrt{2}},\frac{1}{\sqrt{2}},\frac{1}{\sqrt{2}}$

27. The unit vector along $\hat{i}+\hat{j}$ is:

(1) k (2) $\hat{i}+\hat{j}$

(3) $\frac{\hat{i}+\hat{j}}{\sqrt{2}}$ (4) $\frac{\hat{i}+\hat{j}}{2}$

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

(1) $\frac{1}{7}[3\hat{i}+6j-2k]$ (2) $\frac{1}{7}[3\hat{i}+6j+2k]$

(3) $\frac{1}{49}[3\hat{i}+6j+2k]$ (4) $\frac{1}{49}[3\hat{i}+6j-2k]$

29. If $\vec{A}+\vec{B}$ is a unit vector along x-axis and $\vec{A}=\hat{i}-\hat{j}+k$, then what is $\vec{B}$?

(1) $\hat{j}+\hat{k}$ (2) $j-k$

(3) $\hat{i}+\hat{j}+\hat{k}$ (4) $\hat{i}+\hat{j}-\hat{k}$

30. The angle that the vector $\vec{A}=2\hat{i}+3\hat{j}$ makes with y-axis is:

(1) $\tan^{-1}(3/2)$ (2) $\tan^{-1}(2/3)$

(3) $\sin^{-1}(2/3)$ (4) $\cos^{-1}(3/2)$

31. What happens, when we multiply a vector by (-2)?

(1) direction reverses and unit changes

(2) direction reverses and magnitude is doubled

(3) direction remains unchanged and unit changes

(4) none of these

32. Two vectors of equal magnitude have a resultant equal to either of them in magnitude. The angle between them is:

(1) 60° (2) 90°

(3) 105° (4) 120°

33. A force $(3\hat{i}+2\hat{j})$N displaces an object through a distance $(2\hat{i}-3\hat{j})$m. The work $(W=\vec{F}\cdot\vec{S})$ done is:

(1) zero (2) 12 J

(3) 5 J (4) 13 J

34. The angle between the two vectors $\vec{A}=3\hat{i}+4\hat{j}+5\hat{k}$ and $\vec{B}=3\hat{i}+4\hat{j}-5\hat{k}$ will be:

(1) zero (2) 180°

(3) 90° (4) 45°

35. The angle between vectors $(\hat{i}+\hat{j})$ and $(\hat{j}+\hat{k})$ is:

(1) 90° (2) 180°

(3) 0° (4) 60°

36. If $\vec{P}.\vec{Q}=PQ$, then angle between $\vec{P}$ and $\vec{Q}$ is:

(1) 0° (2) 30°

(3) 45° (4) 60°

37. Three vectors $\vec{A},\vec{B}$ and $\vec{C}$ are such that $\vec{A}=\vec{B}+\vec{C}$ and their magnitudes are in ratio 5 : 4 : 3 respectively. Find angle between vector $\vec{A}$ and $\vec{C}$.

38. A unit vector in the direction of resultant vector of $\vec{A}=-2\hat{i}+3\hat{j}-\hat{k}$ and $\vec{B}=\hat{i}+2\hat{j}-4\hat{k}$ is:

(1) $\frac{-2\hat{i}-\hat{j}+\hat{k}}{\sqrt{6}}$ (2) $\frac{2\hat{i}+\hat{j}+\hat{k}}{\sqrt{6}}$

(3) $\frac{-\hat{i}+5\hat{j}-5\hat{k}}{\sqrt{51}}$ (4) $\frac{2\hat{i}-\hat{j}+\hat{k}}{\sqrt{6}}$

39. If $\vec{A}=4\hat{i}-3\hat{j}$ and $\vec{B}=5\hat{i}+18\hat{j}$ then magnitude and direction of $\vec{A}+\vec{B}$ will be:

(1) $17.49, \tan^{-1}(2)$

(2) 15, $\tan^{-1}(4/3)$

(3) 20, $\tan^{-1}(4/5)$

(4) 17.49, $\tan^{-1}(5/3)$

40. The resultant of two vectors $\vec{P}$ and $\vec{Q}$ is $\vec{R}$. If Q is doubled; the new resultant is perpendicular to P, then R equals to:

(1) P (2) Q

(3) $P+Q$ (4) $P-Q$

41. If the magnitudes of vectors $\vec{A}$, $\vec{B}$ and $\vec{C}$ are 4, 3 and 5 units respectively and $\vec{A}+\vec{B}=\vec{C}$, the angle between vectors $\vec{A}$ and $\vec{B}$ is:

(1) 90° (2) $\cos^{-1}\left(\frac{5}{16}\right)$

(3) $\tan^{-1}(5)$ (4) $\tan^{-1}\left(\frac{12}{5}\right)$

42. Two vectors $\vec{A}$ and $\vec{B}$ are such that $|\vec{A}+\vec{B}|=|\vec{A}-\vec{B}|$ then the angle between the two vectors $\vec{A}$ and $\vec{B}$ will be:

(1) π (2) $\frac{\pi}{3}$

(3) $\frac{\pi}{6}$ (4) $\frac{\pi}{2}$

43. The vector projection of a vector $3\hat{i}+5\hat{k}$ on y-axis is:

(1) 5 (2) 4

(3) 3 (4) Zero

44. If $\vec{A}=3\hat{i}+5\hat{j}-7\hat{k}$, the direction of cosines of the vector $\vec{A}$ are:

(1) $\frac{2}{\sqrt{83}},\frac{5}{\sqrt{83}},\frac{7}{\sqrt{83}}$

(2) $\frac{3}{\sqrt{83}},\frac{5}{\sqrt{83}},\frac{7}{\sqrt{83}}$

(3) $\frac{1}{\sqrt{83}},\frac{2}{\sqrt{83}},\frac{5}{\sqrt{83}}$

(4) $\frac{3}{\sqrt{83}},\frac{5}{\sqrt{83}},\frac{-7}{\sqrt{83}}$

45. The angle between vectors $(\hat{i}+\hat{j})$ and $(\hat{j}+\hat{k})$ is;

(1) 90° (2) 180°

(3) 0° (4) 60°

46. Consider two vectors $\overrightarrow{F_1}=2\hat{i}+5k$ and $\overrightarrow{F_2}=3j+4k$. The magnitude of the scalar product of these vectors is:

(1) 26 (2) 28

(3) 30 (4) 20

47. What is the angle between $\hat{i}+\hat{j}+\hat{k}$ and $\hat{i}$?

(1) $\cos^{-1}\left(\frac{1}{2}\right)$ (2) $\cos^{-1}\left(\frac{1}{\sqrt{2}}\right)$

(3) $\cos^{-1}\left(\frac{1}{3}\right)$ (4) $\cos^{-1}\left(\frac{1}{\sqrt{3}}\right)$

Answer Key

1. $5\sqrt{2}$ m/s

2. (i) 12, (ii) 5, (iii) 13, (iv) $\alpha = \tan^{-1}\frac{5}{12}$,

(v) $\beta = \tan^{-1}\frac{12}{5}$, (vi) $\frac{12\hat{i}+5\hat{j}}{13}$

3. **(1)**

4. $\frac{250}{\sqrt{3}}$

5. (i) 1, 1, $\sqrt{2}$, (ii) 2, (iii) $\cos\alpha = \frac{1}{2}, \cos\beta = \frac{1}{2}, \cos\gamma\frac{1}{\sqrt{2}}$

(iv) 60°, 60°, 45°

6. (i) $4\hat{i}+3\hat{j}+12\hat{k}$, (ii) 13, (iii) $\hat{R} = \frac{4\hat{i}+3\hat{j}+12\hat{k}}{13}$,

(iv) $\cos\alpha = \frac{4}{13}, \cos\beta = \frac{3}{13}, \cos\gamma\frac{12}{13}$

7. $\hat{R} = \frac{\hat{i}-3\hat{j}+\hat{k}}{\sqrt{11}}$

8. $\vec{x} = -3\hat{i}-\hat{j}-3\hat{k}$

9. **(4)**

10. **(1)**

11. **(2)**

12. **(3)**

13. $\theta = \cos^{-1}\frac{16}{65}$

14. **(4)**

15. **(4)**

16. Magnitude = 13, Direction cosines = $\frac{3}{13}, \frac{4}{13}, \frac{12}{13}$

17. **(45°, 45°)**

18. $\alpha = \cos^{-1}\frac{1}{\sqrt{3}}$, $\beta = \cos^{-1}\frac{1}{\sqrt{3}}$, $\gamma = \cos^{-1}\frac{1}{\sqrt{3}}$

19. Vertical component = 2N,

Horizontal component = $2\sqrt{3}$N

20. $40\sqrt{3}$N

21. $-2\hat{i}-9\hat{j}+7\hat{k}$

22. $|\overrightarrow{OC}| = 10\sqrt{2}$N, OB = 10 N

23. F_{min} = 6N

24. **(2)**

25. **(3)**

26. **(3)**

27. **(3)**

28. **(1)**

29. **(2)**

30. **(2)**

31. **(2)**

32. **(4)**

33. **(1)**

34. **(3)**

35. **(4)**

36. **(1)**

37. **(53°)**

38. **(3)**

39. **(4)**

40. **(2)**

41. **(1)**

42. **(4)**

43. **(4)**

44. **(4)**

45. **(4)**

46. **(4)**

47. **(4)**