

Topic : Vector

Type of Questions

M.M., Min.

Single choice Objective (no negative marking) Q.1,2,3

(3 marks, 3 min.)

[9, 9]

Multiple choice objective (no negative marking) Q.4

(5 marks, 4 min.)

[5, 4]

Subjective Questions (no negative marking) Q.5,6,7,8

(4 marks, 5 min.)

[16, 20]

- Let \hat{a} , \hat{b} , \hat{c} are three unit vectors such that $\hat{a} + \hat{b} + \hat{c}$ is also a unit vector. If pairwise angles between \hat{a} , \hat{b} , \hat{c} are θ_1 , θ_2 and θ_3 respectively then $\cos \theta_1 + \cos \theta_2 + \cos \theta_3$ equals
(A) $(-3/2)$ (B) -3 (C) 1 (D) -1
- A tangent is drawn to the curve $y = \frac{8}{x^2}$ at a point $A(x_1, y_1)$, where $x_1 = 2$. The tangent cuts the x-axis at point B. Then the scalar product of the vectors \vec{AB} and \vec{OB} is :
(A) 3 (B) -3 (C) 6 (D) -6
- If the angle between \vec{a} and \vec{c} is 25° and the angle between \vec{b} and \vec{c} is 65° and $\vec{a} + \vec{b} = \vec{c}$ then the angle between \vec{a} and \vec{b}
(A) 45° (B) 60° (C) 65° (D) 90°
- The vectors $\vec{a} = 3\hat{i} - 2\hat{j} + 2\hat{k}$ and $\vec{b} = -\hat{i} - 2\hat{k}$ are adjacent sides of a parallelogram. Then angle between its diagonals is
(A) $\pi/4$ (B) $\pi/3$ (C) $3\pi/4$ (D) $2\pi/3$
- If $\vec{OA} = \hat{i} + 2\hat{j} + 3\hat{k}$, $\vec{OB} = 3\hat{i} + 4\hat{j} + 7\hat{k}$, $\vec{OC} = -3\hat{i} - 2\hat{j} - 5\hat{k}$ where O is origin then find the ratio in which point B divide AC.
- If \vec{a} and \vec{b} are non collinear vectors and $\vec{A} = (p + 4q)\vec{a} + (2p + q + 1)\vec{b}$, $\vec{B} = (-2p + q + 2)\vec{a} + (2p - 3q - 1)\vec{b}$ then determine p and q such that $3\vec{A} = 2\vec{B}$
- In a triangle OAB, E is mid point OB and D is point on AB such that $AD : DB = 2 : 1$. If OD and AE intersects at P determine ratio OP : PD using vector method (where O is origin)
- In a $\triangle ABC$, D divides BC in the ratio $3 : 2$ internally and E divides CA in the ratio $1 : 3$ internally. The lines AD and BE meet at H and CH meet AB in F, Find the ratio in which F divides AB

Answers Key

1. (D) 2. (A) 3. (D) 4. (A)(C)
5. 1 : 3 externally 6. $p = 2, q = -1$
7. 3 : 2 8. 2 : 1