SCALAR AND VECTOR ASSIGNMENT 2

1. If a vector $2\hat{i}+3\hat{j}+8\hat{k}$ is perpendicular to the vector $4\hat{j}-4\hat{i}+\alpha\hat{k}$. Then the value of α is

(a) -1 (b) $\frac{1}{2}$

(c) $-\frac{1}{2}$ (d) 1

2. If two vectors $2\hat{i}+3\hat{j}-\hat{k}$ and $-4\hat{i}-6\hat{j}-\lambda\hat{k}$ are parallel to each other then value of λ be

(a) 0 (b) 2

(c) 3 (d) 4

3. A body, acted upon by a force of 50 N is displaced through a distance 10 *meter* in a direction making an angle of 60° with the force. The work done by the force be

(a) 200 J (b) 100 J

(c) 300 (d) 250 J

4. A particle moves from position $3\hat{i}+2\hat{j}-6\hat{k}$ to $14\hat{i}+13\hat{j}+9\hat{k}$ due to a uniform force of $(4\hat{i}+\hat{j}+3\hat{k})N$. If the displacement in meters then work done will be

(a) 100 J (b) 200 J

(c) 300 J (d) 250 J

5. Consider two vectors $\vec{F}_1=2\hat{i}+5\hat{k}$ and $\vec{F}_2=3\hat{j}+4\hat{k}$. The magnitude of the scalar product of these vectors is

(a) 20 (b) 23

(c) $5\sqrt{33}$ (d) 26

6. Consider a vector $\vec{F}=4\hat{i}-3\hat{j}$. Another vector that is perpendicular to $\vec{F}$ is

(a) $4\hat{i}+3\hat{j}$ (b) $6\hat{i}$

(c) $7\hat{k}$ (d) $3\hat{i}-4\hat{j}$

7. Two vectors $\vec{A}$ and $\vec{B}$ are at right angles to each other, when

(a) $\vec{A}+\vec{B}=0$ (b) $\vec{A}-\vec{B}=0$

(c) $\vec{A}\times\vec{B}=0$ (d) $\vec{A}.\vec{B}=0$

8. If $\vec{A} \times \vec{B} = \vec{B} \times \vec{A}$ then the angle between A and B is

(a) $\pi / 2$ (b) $\pi / 3$

(c) π (d) $\pi / 4$

9. If $\vec{A} = 3\hat{i} + \hat{j} + 2\hat{k}$ and $\vec{B} = 2\hat{i} - 2\hat{j} + 4\hat{k}$ then value of $|\vec{A} \times \vec{B}|$ will be

(a) $8\sqrt{2}$ (b) $8\sqrt{3}$

(c) $8\sqrt{5}$ (d) $5\sqrt{8}$

10. The torque of the force $\vec{F} = (2\hat{i} - 3\hat{j} + 4\hat{k})N$ acting at the point $\vec{r} = (3\hat{i} + 2\hat{j} + 3\hat{k})\,m$ about the origin be

(a) $6\hat{i} - 6\hat{j} + 12\hat{k}$ (b) $17\hat{i} - 6\hat{j} - 13\hat{k}$

(c) $-6\hat{i} + 6\hat{j} - 12\hat{k}$ (d) $-17\hat{i} + 6\hat{j} + 13\hat{k}$

11. The area of the parallelogram whose sides are represented by the vectors $\hat{j} + 3\hat{k}$ and $\hat{i} + 2\hat{j} - \hat{k}$ is

(a) $\sqrt{61}$ sq.unit (b) $\sqrt{59}$ sq.unit

(c) $\sqrt{49}$ sq.unit (d) $\sqrt{52}$ sq.unit

12. The position of a particle is given by $\vec{r} = (\hat{i} + 2\hat{j} - \vec{k})$ momentum $\vec{P} = (3\hat{i} + 4\hat{j} - 2\vec{k})$. The angular momentum is perpendicular to

(a) x-axis

(b) y-axis

(c) z-axis

(d) Line at equal angles to all the three axes

13. Two vector A and B have equal magnitudes. Then the vector $A + B$ is perpendicular to

(a) $A \times B$ (b) $A - B$

(c) $3A - 3B$ (d) All of these