1. If $(1,5,35)$, $(7,5,5)$, $(1,\lambda,7)$ and $(2\lambda,1,2)$ are coplanar, then the sum of all possible values of λ is:

(1) $\frac{44}{5}$ (2) $-\frac{44}{5}$
(3) $\frac{39}{5}$ (4) $-\frac{39}{5}$

2. The sum of the distinct real values of μ for which the vectors $\mu\hat{i}+\hat{j}+\hat{k}$, $\hat{i}+\mu\hat{j}+\hat{k}$, $\hat{i}+\hat{j}+\mu\hat{k}$ are co-planar, is

(1) 0 (2) -1
(3) 1 (4) 2

3. Let the volume of a parallelepiped whose coterminous edges are given by $\vec{u}=\hat{i}+\hat{j}+\lambda\hat{k}$, $\vec{v}=\hat{i}+\hat{j}+3\hat{k}$ and $\vec{w}=2\hat{i}+\hat{j}+\hat{k}$ be 1 cu. unit. If θ be the angle between the edges $\vec{u}$ and $\vec{w}$, then the value of $\cos\theta$ can be

(1) $\frac{7}{6\sqrt{6}}$ (2) $\frac{7}{6\sqrt{3}}$
(3) $\frac{5}{7}$ (4) $\frac{5}{3\sqrt{3}}$

4. If $\vec{a}=\frac{1}{\sqrt{10}}(3i+k)$ and $\vec{b}=\frac{1}{7}(2i+3j-6k)$, then the value of $(2\vec{a}-\vec{b}).[(\vec{a}\times\vec{b})\times(\vec{a}+2\vec{b})]$is

(1) 5 (2) 3
(3) - 5 (4) - 3

5. If $\vec{a}$, $\vec{b}$, $\vec{c}$ are three non - coplanar vector, then $\frac{\vec{a}\cdot\left(\vec{b}\times\vec{c}\right)}{\left(\vec{c}\times\vec{a}\right)\cdot\vec{b}}+\frac{\vec{b}\cdot\left(\vec{a}\times\vec{c}\right)}{\vec{c}\cdot\left(\vec{a}\times\vec{b}\right)}=$

(1) 0 (2) 2
(3) -2 (4) None of these

6. If $\vec{a}$, $\vec{b}$, $\vec{c}$ are mutually perpendicular vectors having magnitude $1,\ 2,\ 3$ respectively, then $\left[\vec{a}+\vec{b}+\vec{c}\quad \vec{b}-\vec{a}\quad \vec{c}\right]$

(1) 0 (2) 6
(3) 12 (4) 18

7. Let $\vec{a}$, $\vec{b}$, $\vec{c}$ are three vectors along the adjacent edges of a tetrahedron, if $|a|=|b|=|c|=2$ and $\vec{a}.\ \vec{b}=\vec{b}.\ \vec{c}=\vec{c}.\ \vec{a}=2$, then volume of tetrahedron is

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

8. If $\vec{a}$, $\vec{b}$, $\vec{c}$ are non-zero vectors such that $\left(\vec{a}\times\vec{b}\right)\times\vec{c}=\frac{1}{3}\left|\vec{b}\right|\left|\vec{c}\right|\vec{a}$, $\vec{c}\perp\vec{a}$ and θ is the angle between the vector $\vec{b}$, $\vec{c}$ then $\sin\theta=$

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

9. Let $\vec{a}=2\hat{i}+3\hat{j}+4\hat{k}$, $\vec{b}=\hat{i}-2\hat{j}+\hat{k}$ and $\vec{c}=\hat{i}+\hat{j}-\hat{k}$. If $\vec{r}\times\vec{a}=\vec{b}$ and $\vec{r}\cdot\vec{c}=3$, then the value of $\left|\vec{r}\right|$ is equal to

(1) $\sqrt{155}$ (2) $\sqrt{17}$
(3) $2\sqrt{17}$ (4) 3

10. For unit vectors $\vec{b}$ and $\vec{c}$ and any non-zero vector $\vec{a}$, the value of $\left\{\left(\vec{a}+\vec{b}\right)\times\left(\vec{a}+\vec{c}\right)\right\}\times\left(\vec{b}\times\vec{c}\right)\Big\}\cdot\left(\vec{b}+\vec{c}\right)$ is

(1) $|a|^2$ (2) $2|a|^2$
(3) $3|a|^2$ (4) None of these