. If the vectors $\mathbf{a}=\hat{\mathbf{i}}-\hat{\mathbf{j}}+2\hat{\mathbf{k}}$, $\mathbf{b}=2\hat{\mathbf{i}}+4\hat{\mathbf{j}}+\hat{\mathbf{k}}$ and $\mathbf{c}=\lambda\hat{\mathbf{i}}+\hat{\mathbf{j}}+\mu\hat{\mathbf{k}}$ are mutually orthogonal, then (λ, μ) is equal to **[AIEEE 2010]**

(a) $(-3, 2)$ (b) $(2, -3)$

(c) $(-2, 3)$ (d) $(3, -2)$

Exp. **(a)**

Since, the given vectors are mutually orthogonal, therefore

$$\mathbf{a}\cdot\mathbf{b}=2-4+2=0$$

$$\mathbf{a}\cdot\mathbf{c}=\lambda-1+2\mu=0 \quad \ldots(i)$$

and $$\mathbf{b}\cdot\mathbf{c}=2\lambda+4+\mu=0 \quad \ldots(ii)$$

On solving Eqs. (i) and (ii), we get

$$\mu=2$$

and $$\lambda=-3$$

Hence, $$(\lambda, \mu)=(-3, 2)$$