I 45

SECTION - A

1. The inverse of the matrix $A = \begin{pmatrix} \cosh\theta & \sinh\theta \\ \sinh\theta & \cosh\theta \end{pmatrix}$ is

   (A) $\begin{pmatrix} \cosh\theta & \sinh\theta \\ \sinh\theta & \cosh\theta \end{pmatrix}$

   (B) $\begin{pmatrix} \cosh\theta & -\sinh\theta \\ -\sinh\theta & \cosh\theta \end{pmatrix}$

   (C) $\begin{pmatrix} -\cosh\theta & \sinh\theta \\ \sinh\theta & -\cosh\theta \end{pmatrix}$

   (D) $\begin{pmatrix} \cosh\theta & \sinh\theta \\ -\sinh\theta & \cosh\theta \end{pmatrix}$

2. The eigenvectors of a matrix corresponding to distinct eigenvalues are

   (A) linearly dependent

   (B) linearly independent

   (C) orthonormal

   (D) either dependent or independent according to the nature of the determinant of the matrix

3. The function $y = f(x)$ satisfying the condition $f\left(x + \frac{1}{x}\right) = x^2 + \frac{1}{x^2}$, $x \neq 0$, is given by

   (A) $y = x^2 + 2$

   (B) $y = x^2 - 2$

   (C) $y = x^2 - 1$

   (D) $y = x^2 + 1$

4. The set of points in the complex plane with $\arg(z) = \frac{\pi}{3}$ represents

   (A) the straight line $y = \frac{\pi}{3}x$

   (B) the straight line $y = \sqrt{3}\,x$

   (C) the straight line $x + y = \sqrt{3}$

   (D) the straight line $x = \sqrt{3}\,y$