ALGEBRA

1. $\left(\sec^2\theta - 1\right)\left(\csc^2\theta - 1\right)$ is equal to:

   (a) -1

   (b) 1

   (c) 0

   (d) 2

2. The roots of equation

$$x^2 + 3x - 10 = 0 \tag{1}$$

   are:

   (a) $(2, -5)$

   (b) $(-2, 5)$

   (c) $(2, 5)$

   (d) $(-2, -5)$

3. If α , β are zeroes of the polynomial $x^2 - 1$,then value of $(\alpha + \beta)$ is:

   (a) 2

   (b) 1

   (c) 1

   (d) 0

4. If α, β are the zeroes of the polynomial

$$p(x) = 4x^2 - 3x - 7 \tag{2}$$

,then $\left(\frac{1}{\alpha} + \frac{1}{\beta}\right)$ is equal to:

(a) $\frac{7}{3}$

(b) $\frac{-7}{3}$

(c) $\frac{3}{7}$

(d) $\frac{-3}{7}$

5. Find the sum and product of the roots of the quadratic equation

$$2x^2 - 9x + 4 = 0 \tag{3}$$

6. Find the discriminant of the quadratic equation

$$4x^2 - 5 = 0 \tag{4}$$

and hence comment on the nature of roots of the equation.

7. Evaluate $2\sec^2\theta + 3\csc^2\theta - 2\sin\theta\cos\theta$ if

$$\theta = 45^\circ \tag{5}$$

8. If

$$\sin\theta - \cos\theta = 0 \tag{6}$$

,then find the value of $\sin^4\theta + \cos^4\theta$.