MATHEMATICS

DPP
DAILY PRACTICE PROBLEMS

DPP No. 15

Total Marks : 22

Max. Time : 23 min.

Topic : Quadratic Equation

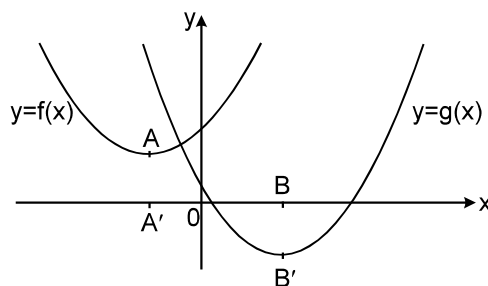| Type of Questions		M.M., Min.
Comprehension (no negative marking) Q.1 to Q.3	(3 marks, 3 min.)	[9, 9]
Single choice Objective (no negative marking) Q.4,5,6	(3 marks, 3 min.)	[9, 9]
Subjective Questions (no negative marking) Q.7	(4 marks, 5 min.)	[4, 5]

COMPREHENSION (For Q.No. 1 to 3)

Let $f(x) = x^2 + 2ax + b$, $g(x) = cx^2 + 2dx + 1$ be quadratic expressions whose graph is as shown in the figure

Here it is given that $|AA'| = |BB'|$ and $|OA'| = |OB|$.

1. Which of the following statements is correct
(A) $a^2 + d = d^2 + c$
(B) $a + d = b + c$
(C) $a^2 + d^2 = c + b$
(D) $bc + c = a^2c + d^2$

2. Sum of roots of equations $f(x) = 0$ and $g(x) = 0$ is

(A) 0
(B) $2(a + d)$
(C) $1 + b$
(D) $2a - \dfrac{2d}{c}$

3. If $|OA'| = |AA'| = 1$, then the values of 'm' for which $(g(x))^2 + mg(x) + 4 = 0$ has two real roots which are distinct
(A) $(0, 4)$
(B) $(4, \infty)$
(C) $(4, 5)$
(D) $(5, \infty)$

4. If α & β are the roots of the quadratic equation $ax^2 + bx + c = 0$, then the quadratic equation,
$ax^2 - bx(x - 1) + c(x - 1)^2 = 0$ has roots :

(A) $\dfrac{\alpha}{1-\alpha}, \dfrac{\beta}{1-\beta}$
(B) $\alpha - 1, \beta - 1$
(C) $\dfrac{\alpha}{\alpha+1}, \dfrac{\beta}{\beta+1}$
(D) $\dfrac{1-\alpha}{\alpha}, \dfrac{1-\beta}{\beta}$

5. If α, β, γ are the roots of the equation $x^3 - px^2 + qx - r = 0$, then the value of $\sum \alpha^2\beta$ is equal to
(A) $pq + 3r$
(B) $pq + r$
(C) $pq - 3r$
(D) q^2/r

6. If α, β, γ are the roots of the equation $x^3 - px^2 + qx - r = 0$, then the value of

$\left(\dfrac{1}{\alpha^2} + \dfrac{1}{\beta^2} + \dfrac{1}{\gamma^2} \right)$ is :

(A) $\dfrac{p^2 - 2qr}{r^2}$
(B) $\dfrac{q^2 - 2pr}{r^2}$
(C) $\dfrac{r^2 - 2pq}{r^2}$
(D) none of these

7. Find all values of 'k' for which the inequality $(x - 3k)(x - k - 3) < 0$ is true " $x \in [1, 3]$.

Answers Key

1. (D)   **2.** (A)   **3.** (D)   **4.** (C)

5. (C)   **6.** (B)   **7.** $k \in \left(0, \dfrac{1}{3}\right)$