MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 15

Total Marks : 22

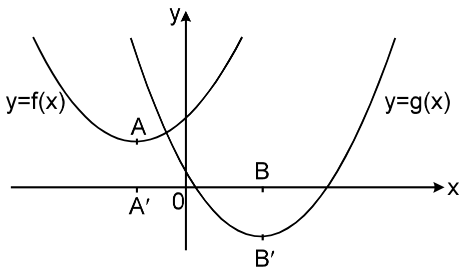
Max. Time : 23 min.

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) $2a - \frac{2d}{c}$

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

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

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

(A) $\frac{p^2 - 2qr}{r^2}$ (B) $\frac{q^2 - 2pr}{r^2}$ (C) $\frac{r^2 - 2pq}{r^2}$ (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.**	$k \in \left(0, \frac{1}{3}\right)$		