MATHEMATICS

DPP

DAILY PRACTICE PRODUCTS

DPP No. 41

Total Marks : 27

Max. Time : 30 min.

Topics : Fundamentals of Mathematics, Quadratic Equations

Type of Questions		**M.M., Min.**
Single choice Objective ('–1' negative marking) Q.1	**(3 marks, 3 min.)**	**[3, 3]**
Multiple choice objective ('–1' negative marking) Q.2	**(5 marks, 4 min.)**	**[5, 4]**
Assertion and Reason (no negative marking) Q.6	**(3 marks, 3 min.)**	**[3, 3]**
Subjective Questions ('–1' negative marking) Q.3,4,5,7	**(4 marks, 5 min.)**	**[16, 20]**

1. The equation $|x + 1| \cdot |x - 1| = a^2 - 2a - 3$ can have real solutions for 'x', if 'a' lies in the interval

(A) $(-\infty, -1] \cup [3, \infty)$
(B) $[1 - \sqrt{5}, 1 + \sqrt{5}]$
(C) $[1 - \sqrt{5}, -1] \cup [3, 1 + \sqrt{5}]$
(D) None of these

2. Let the number of positive and negative solutions of $x^2 - 6x - |5x - 15| - 5 = 0$ be ℓ and m respectively, then

(A) $\ell + m = 2$
(B) $3\ell + m = 4$
(C) $3\ell - m = 0$
(D) $3\ell - m = 2$

3. If α, β are the roots of the equation $x^2 - px + q = 0$, then find the equaiton the roots of which are $(\alpha^2 - \beta^2)(\alpha^3 - \beta^3)$ and $\alpha^3\beta^2 + \alpha^2\beta^3$.

4. If the roots of the equation $ax^2 + bx + c = 0$ are of the form $\frac{k+1}{k}$ and $\frac{k+2}{k+1}$, prove that $(a + b + c)^2 = b^2 - 4ac$.

5. Find a quadratic equation whose one root is square root of $-47 + 8\sqrt{-3}$.

6. **STATEMENT 1 :** Equation $(x^2 - 1)^2 + (x^2 + x - 2)^2 + (x^2 - 3x + 2)^2 = 0$ has only one solution.

STATEMENT 2 : If $|a_1| + |a_2| + \ldots\ldots\ldots + |a_n| = 0$, then $a_1 = a_2 = \ldots\ldots\ldots\ldots = a_n = 0$.

(A) STATEMENT-1 is True, STATEMENT-2 is True ; STATEMENT-2 is a correct explanation for STATEMENT-1
(B) STATEMENT-1 is True, STATEMENT-2 is True ; STATEMENT-2 **is NOT** a correct explanation for STATEMENT-1
(C) STATEMENT-1 is True, STATEMENT-2 is False
(D) STATEMENT-1 is False, STATEMENT-2 is True

7. If α and β are the roots of $x^2 - p(x + 1) - c = 0$, show that $(\alpha + 1)(\beta + 1) = 1 - c$.

Hence prove that $\frac{\alpha^2 + 2\alpha + 1}{\alpha^2 + 2\alpha + c} + \frac{\beta^2 + 2\beta + 1}{\beta^2 + 2\beta + c} = 1$.

Answers Key

1. (A) **2.** (A)(B)(D) **3.** $t^2 - St + P = 0$ where
$S = p[p^4 - 5p^2q + 5q^2]$ and $P = p^2q^2(p^4 - 5p^2q + 4q^2)$

5. $x^2 \pm 2x + 49 = 0$ **6.** (B)