MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 4

Total Marks : 34

Max. Time : 36 min.

Topics : Quadratic Equation, Fundamentals of Mathematics, Circle, Complex Number

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]**
Fill in the Blanks (no negative marking) Q.7, 8	**(4 marks, 4 min.)**	**[8, 8]**
Subjective Questions (no negative marking) Q.9, 10	**(4 marks, 5 min.)**	**[8, 10]**

COMPREHENSION (For Q.No. 1 to 3)

A polynomial P(x) of third degree vanish when x = 1 & x = – 2. This polynomial have the values 4 & 28 when x = – 1 and x = 2 respectively.

1. One of the factor of P(x) is

(A) x + 1 (B) x – 2 (C) 3x + 1 (D) none of these

2. If the polynomial P(x) is divided by (x + 3), the remainder is

(A) – 32 (B) 100 (C) 32 (D) 0

3. P(i), where $i = \sqrt{-1}$ is

(A) purely real (B) purely imaginary (C) imaginary (D) none of these

4. The value of x satisfying the equation $\frac{6x + 2a + 3b + c}{6x + 2a - 3b - c} = \frac{2x + 6a + b + 3c}{2x + 6a - b - 3c}$ is

(A) ab/c (B) 2ab/c (C) ab/3c (D) ab/2c

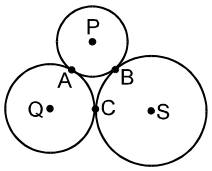
5. If $x = 3 - \sqrt{8}$, then $x^3 + \frac{1}{x^3}$ is equal to

(A) 6 (B) 198 (C) $6\sqrt{2}$ (D) 102

6. Which of these five numbers $\sqrt{\pi^2}$, $\sqrt[3]{0.8}$, $\sqrt[4]{0.00016}$, $\sqrt[3]{-1}$, $\sqrt{(0.09)^{-1}}$, is (are) rational :

(A) none (B) all (C) the first and fourth (D) only fourth and fifth

7. Circles with centres P, Q & S are touching each other externally as shown in the figure at points A, B & C . If the radii of circles with centres P, Q & S are 1, 2 and 3 respectively then the length of chord AB is _____



8. In a circle, chords AB and CD intersect at a point R inside the circle. If AR : RB = 1: 4 and CR: RD = 4: 9, then the ratio AB: CD is _____.

9. (i) Find the smallest positive integer 'n' for which $\left(\frac{1+i}{1-i}\right)^n = 1$

(ii) If $g(x) = x^4 - x^3 + x^2 + 3x - 5$, find g(2 + 3i)

(iii) Given that x, y ∈ R, solve

(a) $x^2 - y^2 - i(2x + y) = 2i$ (b) $(x + 2y) + i(2x - 3y) = 5 - 4i$

10. Find the real values of x & y for which $z_1 = 9y^2 - 4 - 10\,i\,x$ and $z_2 = 8y^2 - 20\,i$ are conjugate complex of each other.

Answers Key

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

5. (B) **6.** (D) **7.** $\sqrt{2}$ **8.** 15: 13

9. (i) 4 (ii) $-(77 + 108i)$

(iii) (a) $x = -2, -\frac{2}{3}$, $y = 2, -\frac{2}{3}$ (b) $x = 1, y = 2$

10. $(-2, 2); (-2, -2)$