I. Answer the following: $(1 \times 5 = 5)$

1. $2\sqrt{3} + \sqrt{3}$ is equal to

   (a) $2\sqrt{6}$ (b) 6   (c) $3\sqrt{3}$ (d) $4\sqrt{6}$

2. The value of $p(t) = 2 + t + 2t^2 - t^3$ when $t = 0$ is

   (a) 2   (b) 1   (c) 4   (d) 0

3. In which quadrant(s), abscissa of a point is negative?

   (a) I and IV quadrants   (b) II and III quadrants

   (c) I and II quadrants   (d) III and IV quadrants

DIRECTION: In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)

(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of Assertion (A)

(c) Assertion (A) is true but reason(R) is false.

(d) Assertion (A) is false but reason(R) is true.

4. **Assertion (A):** 0.271 is a terminating decimal and we can express this number as which is of the form p/q, where p and q are integers and $q \neq 0$

   Reason (R): A terminating or non-terminating decimal expansion can be expressed as rational number

5. **Assertion (A):** Degree of non-zero constant polynomial is zero

   Reason (R): Polynomial having two terms are called binomial.

II. Answer the following: $(2 \times 5 = 10)$

6. Find 5 rational numbers between $\frac{3}{4}$ and $\frac{4}{5}$.

7. Simplify: $[1^3 + 2^3 + 3^3]^{\frac{1}{2}} = 6$

8. Find the value of $(30)^3 + (20)^3 + (-50)^3$

9. Find the zeroes of $(x - 2)^2 - (x+2)^2$

10. Find the coordinates of the point

    a) Whose abscissa is 5 and lies on x-axis.

    b) Whose ordinate is -4 and lies on y-axis.

III. Answer the following: (3 × 4 = 12)

11. Express $0.12\overline{3}$ in the form of $\frac{p}{q}$, where p and q are integers, $q \neq 0$ $= \frac{123}{1000}$

12. If $2x + 3y = 12$ and $xy = 6$, find the value of $8x^3 + 27y^3$. -432

13. Factorise: $x^3 - 6x^2 + 11x - 6$

14. Plot the points A (2, 0), B (5, 0) and C (5, 3). Find the coordinate of the point D such that ABCD is a square. $D = (2, 3)$

IV. Case study based questions.   (4 × 2 = 8)

15. On one day, principal of a particular school visited the classroom. Class teacher was teaching the concept of polynomial to students. He was very much impressed by her way of teaching. To check, whether the students also understand the concept taught by her or not, he asked various questions to students. Some of them are given below. Answer them.

    a) Name the type of polynomial $ax^2 + bx + c$, $a = 0$ quadratic   (1)
    b) Find the number of zeroes of the polynomial $x^2 + 4x + 2$.   (1)
    c) If $x + 2$ is the factor of $x^3 - 2ax^2 + 16$, then find the value of a.   (2)

16. From the given figure,
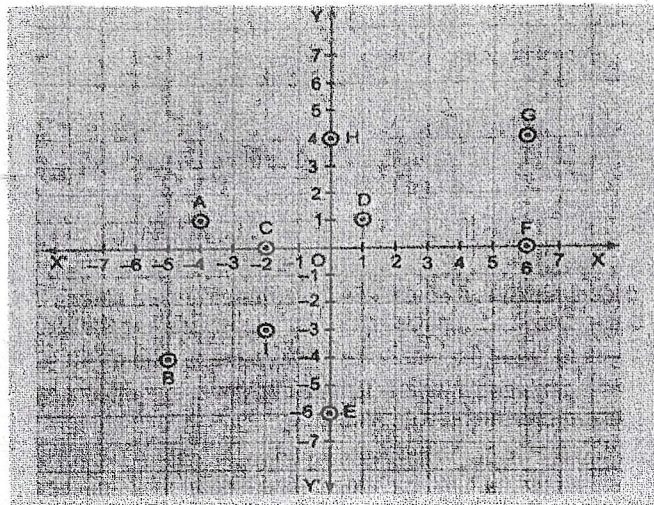
    a) Write the coordinates of the points B and F.   (1)
    b) Name the point identified by the coordinates (1, 1)   (1)
    c) Write the abscissa of the points D and H.   (1)
    d) Name the quadrant in which points B and I lie.   (1)

V. Answer the following: (5 × 1 = 5)

17. If $x = \frac{2+\sqrt{5}}{2-\sqrt{5}}$ and $y = \frac{2-\sqrt{5}}{2+\sqrt{5}}$, find the value of $x^2 + y^2$.

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