

► Choose the right answer from the given options. [1 Marks Each]

[10]

1. If $a + b + c = 0$ then $\left(\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}\right) = ?$
 (A) 1 (B) 0 (C) -1 (D) 3
2. The factors of $a^2 - 1 - 2x - x^2$ are:
 (A) $(a - x + 1)(a - x - 1)$ (B) $(a + x - 1)(a - x + 1)$ (C) $(a + x + 1)(a - x + 1)$ (D) None of these.
3. $(4x^2 + 4x - 3) = ?$
 (A) $(2x - 1)(2x - 3)$ (B) None of these. (C) $(2x + 3)(2x - 1)$ (D) $(2x + 1)(2x - 3)$
4. If $a + b + c = 9$ and $ab + bc + ca = 23$, then $a^3 + b^3 + c^3 - 3abc =$
 (A) 729 (B) 207 (C) 669 (D) 108
5. The zero of the polynomial $p(x) = 5x - 2$ is:
 (A) $\frac{-2}{5}$ (B) $\frac{2}{5}$ (C) $\frac{5}{2}$ (D) $\frac{-5}{2}$
6. Which of the following is a polynomial in one variable?
 (A) $x^2 + x^{-2}$ (B) $\sqrt{2} - x^2 + 3x$ (C) $\sqrt{2x} + 9$ (D) $x^2 + y^8 + 9$
7. The factorization of $9x^2 - 3x - 20$ is:
 (A) $(3x - 4)(3x - 5)$ (B) $(3x + 4)(3x - 5)$ (C) $(3x + 4)(3x + 5)$ (D) $(3x - 4)(3x + 5)$
8. If $x^4 + \frac{1}{x^4} = 194$, then $x^3 + \frac{1}{x^3} =$
 (A) 76 (B) 52 (C) 64 (D) None of these
9. If $3x + \frac{2}{x} = 7$, then $\left(9x^2 - \frac{4}{x^2}\right) =$
 (A) 25 (B) 35 (C) 49 (D) 30
10. For what value of k is the polynomial $p(x) = 2x^3 - kx^2 + 3x + 10$ exactly divisible by $(x + 2)$?
 (A) $-\frac{1}{3}$ (B) $\frac{1}{3}$ (C) 3 (D) -3
11. If $p(x) = x^2 - 2\sqrt{2}x + 1$ then $p(2\sqrt{2}) = ?$
 a. 0
 b. 1
 c. $4\sqrt{2}$
 d. -1
12. The zeros of the polynomial $p(x) = x^2 + x - 6$ are:
 a. 2, 3
 b. -2, 3
 c. 2, -3
 d. -2, -3

► Answer the following short questions. [2 Marks Each]

[8]

13. If $p(x) = 5 - 4x + 2x^2$, find:
 i. $p(0)$
 ii. $p(3)$
 iii. $p(-2)$
14. Using factor theorem, show that $g(x)$ is a factor of $p(x)$, when
 $p(x) = 2x^4 + x^3 - 8x^2 - x + 6$, $g(x) = 2x - 3$
15. Evaluate:
 $(28)^3 + (-15)^3 + (-13)^3$
16. Factorise:
 $6\left(2x - \frac{3}{x}\right)^2 + 7\left(2x - \frac{3}{x}\right) - 20$

► Answer the following questions. [3 Marks Each]

[12]

17. If $x + \frac{1}{x} = 3$, calculate $x^2 + \frac{1}{x^2}$, $x^3 + \frac{1}{x^3}$ and $x^4 + \frac{1}{x^4}$.

18. Factorize:

$$\left(x^2 + \frac{1}{x^2}\right) - 4\left(x + \frac{1}{x}\right) + 6$$

19. Factorize:

$$x^2 + \frac{12}{35}x + \frac{1}{35}$$

20. In the following, using the remainder theorem, find the remainder when $f(x)$ is divided by $g(x)$ and verify the by actual division:

$$f(x) = 9x^3 - 3x^2 + x - 5, g(x) = x - \frac{2}{3}$$
