

**SECTION - A**

**Multiple Choice Questions (MCQs)**

**(1 Mark each)**

1. Which of the following is quadratic polynomial  
 (a)  $x + 2$                       (b)  $x^2 + 2$                       (c)  $x^3 + 2$                       (d)  $2x + 2$                       **Ans. (b)**
2. The zero of the polynomial  $p(x) = 2x + 5$  is :  
 (a)  $\frac{2}{5}$                       (b)  $\frac{5}{2}$                       (c) 0                      (d)  $-\frac{5}{2}$                       **Ans. (d)**
3. If  $x^{51} + 51$  is divided by  $(x + 1)$  the remainder is :  
 (a) 0                      (b) 1                      (c) 49                      (d) 50                      **Ans. (d)**
4. The remainder obtained when the polynomial  $p(x)$  is divided by  $(b - ax)$  is :  
 (a)  $p\left(\frac{-b}{a}\right)$                       (b)  $p\left(\frac{a}{b}\right)$                       (c)  $p\left(\frac{b}{a}\right)$                       (d)  $p\left(\frac{-a}{b}\right)$                       **Ans. (c)**
5.  $a^2 + b^2 + c^2 - ab - bc - ca$  equals :  
 (a)  $(a + b + c)^2$                       (b)  $(a - b - c)^2$                       (c)  $(a - b + c)^2$                       (d)  $\frac{1}{2}[(a - b)^2 + (b - c)^2 + (c - a)^2]$                       **Ans. (d)**
6. Which of the following is a binomial in  $y$  ?  
 (a)  $y^2 + \sqrt{2}$                       (b)  $y + \frac{1}{y} + 2$                       (c)  $\sqrt{y} + \sqrt{2}y$                       (d)  $y\sqrt{y} + 1$                       **Ans. (a)**
7. Which of the following polynomials has  $-3$  as a zero ?  
 (a)  $(x - 3)$                       (b)  $x^2 - 9$                       (c)  $x^2 - 3x$                       (d)  $x^2 + 3$                       **Ans. (b)**
8. Which of the following is a trinomial in  $x$  ?  
 (a)  $3^3 + 1$                       (b)  $x^3 + x^2 + x$                       (c)  $x\sqrt{x} + \sqrt{x} + 1$                       (d)  $x^3 + 2x$                       **Ans. (b)**
9. The value of the polynomial  $x^2 - x - 1$  at  $x = -1$  is :  
 (a)  $-3$                       (b) 1                      (c)  $-1$                       (d) 0                      **Ans. (b)**
10. Which of the following is a polynomial in  $x$  ?  
 (a)  $x + \frac{1}{x}$                       (b)  $x^2 + \sqrt{x}$                       (c)  $x + \sqrt{2}x^2 + 1$                       (d)  $\sqrt{3x} + 1$                       **Ans. (c)**
11. The remainder when  $x^2 + 2x + 1$  is divided by  $(x + 1)$  is  
 (a) 4                      (b) 0                      (c) 1                      (d)  $-2$                       **Ans. (b)**
12. The factors of  $(2a - b)^3 + (b - 2c)^3 + 8(c - a)^3$  is :  
 (a)  $(2a - b)(b - 2c)(c - a)$                       (b)  $3(2a - b)(b - 2c)(c - a)$   
 (c)  $6(2a - b)(b - 2c)(c - a)$                       (d)  $2a \times b \times 2c$                       **Ans. (c)**
13. In which of the following  $(x + 2)$  is a factor ?  
 (a)  $4x^3 - 13x + 6$                       (b)  $x^3 - x^2 + x + 4$                       (c)  $4x^3 - 13x - 25$                       (d)  $-2x^3 + x^2 - 13x - 19$                       **Ans. (d)**
14. One of the factors of  $(x - 1) - (x^2 - 1)$  is:  
 (a)  $x^2 - 1$                       (b)  $x + 1$                       (c)  $x - 1$                       (d)  $x + 4$                       **Ans. (c)**
15. The coefficient of  $x^2$  in the product  $(x - 1)(1 - 2x)$  is :  
 (a) 3                      (b) 3                      (c)  $-2$                       (d) 1                      **Ans. (c)**
16. The coefficient of  $x^2$  in  $(2 - 3x^2)(x^2 - 5)$  is  
 (a)  $-17$                       (b)  $-10$                       (c)  $-3$                       (d) 17                      **Ans. (a)**
17. If a polynomial  $f(x)$  is divided by  $x - a$  then remainder is  
 (a)  $f(0)$                       (b)  $f(a)$                       (c)  $f(-a)$                       (d)  $f(a) - f(0)$                       **Ans. (b)**

18. The degree of the polynomial  $2 - y^2 - y^3 + 2y^7$  is :  
 (a) 2 (b) 7 (c) 0 (d) 3 **Ans. (b)**
19. Degree of zero polynomial is :  
 (a) 0 (b) 1 (c) any natural number (d) not defined **Ans. (d)**
20. Degree of which of the following polynomial is zero :  
 (a)  $x$  (b) 15 (c)  $x^2$  (d)  $x + 1$  **Ans. (b)**
21. What is remainder when  $x^3 - 2x^2 + x + 1$  is divided by  $(x - 1)$  ?  
 (a) 0 (b) -1 (c) 1 (d) 2 **Ans. (c)**
22. The coefficient of  $x^2$  in  $(3x + x^3)\left(x + \frac{1}{x}\right)$  is:  
 (a) 3 (b) 1 (c) 4 (d) 2 **Ans. (c)**
23. Product of  $\left(x - \frac{1}{x}\right)\left(x + \frac{1}{x}\right)\left(x^2 + \frac{1}{x^2}\right)$  is:  
 (a)  $x^4 + \frac{1}{x^4}$  (b)  $x^3 + \frac{1}{x^3} - 2$  (c)  $x^4 - \frac{1}{x^4}$  (d)  $x^2 + \frac{1}{x^2} + 2$  **Ans. (c)**
24. If  $\frac{x}{y} + \frac{y}{x} = -1$  ( $x, y \neq 0$ ), the value of  $x^3 - y^3$  is :  
 (a) 1 (b) -1 (c)  $\frac{1}{2}$  (d) 0 **Ans. (d)**
25.  $(1 + 3x)^3$  is a example of :  
 (a) Monomial (b) Binomial (c) Trinomial (d) None of these **Ans. (d)**
26. If  $p(x) = 2 + \frac{x}{2} + x^2 - \frac{x^3}{3}$  then  $p(-1)$  is:  
 (a)  $\frac{15}{6}$  (b)  $\frac{17}{6}$  (c)  $\frac{1}{6}$  (d)  $\frac{13}{6}$  **Ans. (b)**
27. Zero of the polynomial  $p(x)$  where  $p(x) = ax, a \neq 0$  is:  
 (a) 1 (b)  $a$  (c) 0 (d)  $\frac{1}{a}$  **Ans. (c)**
28. If  $p(x) = 7 - 3x + 2x^2$  then value of  $p(-2)$  is :  
 (a) 12 (b) 31 (c) 21 (d) 22 **Ans. (c)**
29. If  $x^2 + kx + 6 = (x + 2)(x + 3)$  for all  $x$ , the value of  $k$  is  
 (a) 1 (b)  $P1$  (c) 5 (d) 3 **Ans. (c)**
30. Zero of the polynomial  $p(x) = cx + d$  is :  
 (a)  $-d$  (b)  $-c$  (c)  $-\frac{d}{c}$  (d)  $-7$  **Ans. (c)**
31. Degree of the polynomial  $p(x) = 4x^4 + 2x^3 + x^5 + 2x + 7$  is :  
 (a) 7 (b) 4 (c) 5 (d) 3 **Ans. (c)**

### SECTION - B

#### Very Short Answer Type Questions

1. Without actually calculating the cubes, find the value of  $75^3 - 25^3 - 50^3$ .
2. Evaluate  $(999)^3$ .
3. Check whether the polynomial  $t + 1$  is a factor of  $4t^3 + 4t^2 - t - 1$ .
4. Check whether the polynomial  $3x - 1$  is a factor of  $9x^3 - 3x^2 + 3x - 1$ .
5. Check whether  $(x + 1)$  is a factor of  $x^3 + x + x^2 + 1$ .
6. Using factor theorem, show that  $(2x + 1)$  is a factor of  $2x^3 + 3x^2 - 11x - 6$ .
7. Using factor theorem, show that  $(x + 1)$  is a factor of  $x^{19} + 1$ .
8. Without actually calculations of the cubes, find the value of  $30^3 + 20^3 - 50^3$ .

**(2 Marks each)**

**Ans. 281250**

**Ans. 997002999**

**Ans. Yes**

**Ans. Yes**

**Ans. Yes**

**Ans. -90000**

14. The sum of the digits of a number is subtracted from the number, the resulting number is always divisible by:  
 (a) 2 (b) 5 (c) 8 (d) 9 **Ans. (d)**
15. If  $\sqrt{3} = 1.732$  and  $\sqrt{2} = 1.414$ , the value of  $\frac{1}{\sqrt{3}-\sqrt{2}}$  is:  
 (a) 0.318 (b) 3.146 (c)  $\frac{1}{3.146}$  (d)  $\sqrt{1.732} - \sqrt{1.414}$  **Ans. (b)**
16. If  $x = 2 + \sqrt{3}$ , then  $\left(x + \frac{1}{x}\right)$  equals to:  
 (a)  $-2\sqrt{3}$  (b) 2 (c) 4 (d)  $4 - 2\sqrt{3}$  **Ans. (c)**
17. A rational number lying between  $\sqrt{2}$  and  $\sqrt{3}$  is:  
 (a)  $\frac{\sqrt{2} + \sqrt{3}}{2}$  (b)  $\sqrt{6}$  (c) 1.6 (d) 1.9 **Ans. (c)**
18. If  $\sqrt{x}$  is an irrational number then  $x$  is:  
 (a) Rational (b) Irrational (c) 0 (d) Real **Ans. (d)**
19. Which of the following is an irrational number?  
 (a) 2.2 (b)  $\pi$  (c) 3.763 (d)  $\sqrt{3.763}$  **Ans. (b)**
20. Which of the following is an irrational number?  
 (a)  $\sqrt{23}$  (b)  $\sqrt{225}$  (c) 0.3796 (d)  $\sqrt{7478}$  **Ans. (a)**
21. Which of the following is the value of  $(\sqrt{11} - \sqrt{7})(\sqrt{11} + \sqrt{7})$   
 (a) -4 (b) 4 (c)  $\sqrt{11}$  (d)  $\sqrt{7}$  **Ans. (b)**
22. A rational number between -3 and 3 is  
 (a) 0 (b) -4.3 (c) -3.4 (d) 1.101100110001.... **Ans. (a)**
23. A number is an irrational if and only if its decimal representation is:  
 (a) non-terminating (b) non-terminating and repeating  
 (c) non-terminating and non-repeating (d) terminating **Ans. (c)**
24. Add  $5\sqrt{2} + 3\sqrt{3}$  and  $2\sqrt{2} - 5\sqrt{3}$ .  
 (a)  $7\sqrt{2} - 2\sqrt{3}$  (b)  $6\sqrt{2} - 6\sqrt{3}$  (c)  $6\sqrt{2} - 8\sqrt{3}$  (d)  $6\sqrt{2} + 8\sqrt{3}$  **Ans. (a)**
25. The value of  $\sqrt[4]{\sqrt{2^2}}$  equal to:  
 (a)  $2^{-1.6}$  (b)  $2^{-6}$  (c)  $2^{1.6}$  (d)  $2^6$  **Ans. (c)**
26. Which one of the following is an irrational number?  
 (a) 0.14 (b)  $0.\overline{1416}$  (c)  $0.14\overline{16}$  (d) 0.4014001400014.... **Ans. (d)**
27. Which of the following is not the value of  $\left[\left(\frac{5}{6}\right)^{\frac{1}{5}}\right]^{\frac{-1}{6}}$ ?  
 (a)  $\left(\frac{5}{6}\right)^{\frac{1}{6} - \frac{1}{5}}$  (b)  $\left(\frac{5}{6}\right)^{\frac{1}{30}}$  (c)  $\left(\frac{6}{5}\right)^{\frac{1}{30}}$  (d)  $\frac{1}{\left[\left(\frac{5}{6}\right)^{\frac{1}{5}}\right]^{\frac{1}{6}}}$  **Ans. (d)**
28.  $(5 + \sqrt{5})(5 - \sqrt{5})$  on simplification gives:  
 (a) 20 (b)  $2\sqrt{5}$  (c) 10 (d) 25 **Ans. (a)**
29. The simplest rationalisation factor of  $\sqrt{50}$  is:  
 (a)  $5\sqrt{2}$  (b)  $\sqrt{2}$  (c) 50 (d)  $\sqrt{50}$  **Ans. (b)**



30. The sum of  $0.\bar{3}$  and  $0.\bar{4}$  is :  
 (a)  $0.\bar{4}$  (b)  $0.\bar{7}$  (c)  $0.\bar{12}$  (d)  $0.\bar{1}$  **Ans. (b)**
31. Every point on a number line represents :  
 (a) A natural number (b) A rational number (c) An unique number (d) An irrational number **Ans. (c)**
32. 8 is a polynomial of degree :  
 (a) 1 (b)  $\frac{1}{2}$  (c) 1 (d) 0 **Ans. (d)**
33. Simplified value of  $(16)^{\frac{1}{4}} \times \sqrt[4]{16}$  is  
 (a) 16 (b) 4 (c) 1 (d) 0 **Ans. (c)**
34. Which of the following is a rational number ?  
 (a)  $1 + \sqrt{3}$  (b)  $\pi$  (c)  $2\sqrt{3}$  (d) 0 **Ans. (d)**
35. The value of  $\sqrt[3]{216} - \sqrt[3]{125}$  is  
 (a) 1 (b) 0 (c) 2 (d) -1 **Ans. (a)**
36. Which of the following is irrational number ?  
 (a) 0.15 (b) 0.1516 (c) 0.1516 (d) 0.501500150001..... **Ans. (d)**
37. Which of the following number is an irrational number ?  
 (a)  $\sqrt{16} - 4$  (b)  $(3 - \sqrt{3})(3 + \sqrt{3})$  (c)  $\sqrt{5} + 3$  (d)  $-\sqrt{25}$  **Ans. (c)**
38. When  $15\sqrt{15}$  is divided by  $3\sqrt{3}$ , the quotient is :  
 (a)  $5\sqrt{3}$  (b)  $5\sqrt{3}$  (c)  $5\sqrt{5}$  (d)  $3\sqrt{3}$  **Ans. (c)**
39. The value of  $7^{\frac{1}{2}} 8^{\frac{1}{2}}$  is:  
 (a)  $28^{\frac{1}{2}}$  (b)  $56^{\frac{1}{2}}$  (c)  $14^{\frac{1}{2}}$  (d)  $42^{\frac{1}{2}}$  **Ans. (b)**
40.  $\pi$  is:  
 (a) a rational number (b) an integer (c) an irrational number (d) a whole number **Ans. (c)**
41. Which of the following is a rational number ?  
 (a)  $\sqrt{5}$  (b)  $\pi$  (c) 0.101001000100001 (d) 0.853853853... **Ans. (d)**
42. The decimal form of  $\frac{56}{1000}$  is :  
 (a) 0.56 (b) 0.056 (c) 0.0056 (d) 5.6 **Ans. (b)**