QB365 Question Bank Software Study Materials

Theory of Equations 45 Important 1Marks Questions With Answers (Book Back and Creative)

12th Standard

Maths

Total Marks : 45

45 x 1 = 45

1) A zero of $x^3 + 64$ is

(a) 0 (b) 4 (c) 4i **(d) -4**

2) If f and g are polynomials of degrees m and n respectively, and if h(x) = (f ◦ g)(x), then the degree of h is

(a) mn (b) m+n (c) m^n (d) n^m

3) A polynomial equation in x of degree n always has

(a) n distinct roots (b) n real roots **(c) n complex roots** (d) at most one root

4) If α, β and γ are the zeros of $x^3 + px^2 + qx + r$, then $\Sigma\frac{1}{\alpha}$ is

(a) $-\frac{q}{r}$ (b) $-\frac{p}{r}$ (c) $\frac{q}{r}$ (d) $-\frac{q}{p}$

5) According to the rational root theorem, which number is not possible rational zero of $4x^7 + 2x^4 - 10x^3 - 5$?

(a) -1 (b) $\frac{5}{4}$ **(c)** $\frac{4}{5}$ (d) 5

6) The polynomial $x^3 - kx^2 + 9x$ has three real zeros if and only if, k satisfies

(a) $|k| \leq 6$ (b) $k = 0$ (c) $|k| > 6$ **(d) $|k| \geq 6$**

7) The number of real numbers in [0, 2π] satisfying $\sin^4 x - 2\sin^2 x + 1$ is

(a) 2 (b) 4 (c) 1 (d) ∞

8) If $x^3+12x^2+10ax+1999$ definitely has a positive zero, if and only if

(a) $a \geq 0$ (b) $a > 0$ **(c) a < 0** (d) $a \leq 0$

9) The polynomial $x^3 + 2x + 3$ has

(a) one negative and two imaginary zeros (b) one positive and two imaginary zeros (c) three real zeros (d) no zeros

10) The number of positive zeros of the polynomial $\sum_{j=0}^{n} {}_nC_r (-1)^r x^r$ is

(a) 0 **(b) n** (c) < n (d) r

11) If a, b, c ∈ Q and p +√q (p, q ∈ Q) is an irrational root of $ax^2+bx+c = 0$ then the other root is _____

(a) -p+√q (b) p-iq **(c) p-√q** (d) -p-√q

12) The quadratic equation whose roots are ∝ and β is _____

(a) (x - ∝)(x -β) = 0 (b) (x - ∝)(x + β) = 0 (c) ∝ + β = $\frac{b}{a}$ (d) ∝ β = $\frac{-c}{a}$

13) If x is real and $\frac{x^2-x+1}{x^2+x+1}$ then _____

(a) $\frac{1}{3} \leq k \leq$ (b) $k \geq 5$ (c) $k \leq 0$ (d) none

14) Let a > 0, b > 0, c > 0. Theh n both the root of the equation $ax^2+bx+c = 0$ are _____

(a) real and negative **(b) real and positive** (c) rational numbers (d) none

15) The equation $\sqrt{x+1} - \sqrt{x-1} = \sqrt{4x-1}$ has _____

(a) no solution (b) one solution (c) two solution (d) more than one solution

16) If the root of the equation $x^3 + bx^2 + cx - 1 = 0$ form an lncreasing G.P, then _____

(a) one of the roots is 2 **(b) one of the roots is 1** (c) one of the roots is -1 (d) one of the roots is -2

17) For real x, the equation $\left|\frac{x}{x-1}\right| + |x| = \frac{x^2}{|x-1|}$ has _____

(a) one solution (b) two solution **(c) at least two solution** (d) no solution

18) If the equation $ax^2 + bx + c = 0 (a > 0)$ has two roots $\propto$ and β such that $\propto < -2$ and $\beta > 2$, then _____

(a) $b^2 - 4ac = 0$ (b) $b^2 - 4ac < 0$ **(c) $b^2 - 4ac > 0$** (d) $b^2 - 4ac \geq 0$

19) If $(2+\sqrt{3})^{x^2-2x+1} + (2-\sqrt{3})^{x^2-2x-1} = \frac{2}{2-\sqrt{3}}$ then x = _____

(a) 0, 2 (b) 0, 1 (c) 0, 3 (d) 0, $\sqrt{3}$

20) If $\propto$, β, γ are the roots of the equation $x^3 - 3x + 11 = 0$, then $\propto + \beta + \gamma$ is _____.

(a) 0 (b) 3 (c) -11 (d) -3

21) If $x^2 - hx - 21 = 0$ and $x^2 - 3hx + 35 = 0 (h > 0)$ have a common root, then h = _____

(a) 0 (b) 1 **(c) 4** (d) 3

22) If $ax^2 + bx + c = 0$, a, b, c $\in$ R has no real zeros, and if $a + b + c < 0$, then _____

(a) $c > 0$ **(b) $c < 0$** (c) $c = 0$ (d) $c \geq 0$

23) If $p(x) = ax^2 + bx + c$ and $Q(x) = -ax^2 + dx + c$ where $ac \neq 0$ then p(x). Q(x) = 0 has at least _____ real roots.

(a) no (b) 1 **(c) 2** (d) infinite

24) For all x, $x^2 + 2ax + (10 - 3a) > 0$, then the interval in which a lies is _____

(a) $a < -5$ **(b) $-5 < a < 2$** (c) $a > 5$ (d) $2 < a < 5$

25) The set of all real numbers of x for which $x^2 - |x + 2| + x > 0$ _____

(a) $(-\infty, -2) \cup (2, \infty)$ **(b)** $(-\infty, -\sqrt{2}) \cup (\sqrt{2}, \infty)$ (c) $(-\infty, -1) \cup (1, \infty)$ (d) $(\sqrt{2}, \infty)$

26) The number of real zeros of the polynomial function $x^2 + 1$ is _____

(a) 1 **(b) 0** (c) 2 (d) None of these

27) A zero of the polynomial $x^3 + 2x - i$ equals _____

(a) -i (b) 1 (c) 1 - i (d) None of these

28) If α and β are the roots of $ax^2 - bx - c = 0$, then $\alpha + \beta$ equals _____

(a) $\frac{-b}{a}$ (b) $\frac{-c}{a}$ (c) $\frac{a}{b}$ **(d)** $\frac{b}{a}$

29) If α, β, γ are the roots of $x^3 + px^2 + qx + r = 0$ then $\alpha\beta + \beta\gamma + \gamma\alpha$ equals _____

(a) $\frac{-p}{q}$ (b) -p **(c) q** (d) -q

30) A polynomial equation whose roots are 3 times those of the equation $2x^3 + 5x^2 + 7 = 0$ is _____

(a) $3x^3 - 15x^2 + 21 = 0$ **(b)** $2x^3 - 15x^2 - 189 = 0$ (c) $2x^3 + 15x^2 - 189 = 0$ (d) None of these

31) If α is a root of a reciprocal equation f(x) = 0 then another root of f(x) = 0 is _____

(a) $-\frac{1}{\alpha}$ (b) $\frac{1}{\alpha^2}$ (c) $\sqrt{\alpha}$ **(d)** $\frac{1}{\alpha}$

32) The equation $x^3 + 2x + 3 = 0$ has _____

(a) One positive real root **(b) One negative real root** (c) Three real roots (d) None of these

33) Greatest possible number of real roots of $x^{10} - 10x^6 - 5x^3 + x + 4 = 0$ is _____

(a) 6 (b) 5 (c) 10 (d) None of these

34) The equation with rational co-efficients one of whose roots is $\sqrt{5} + \sqrt{2}$ given by _____

(a) $x^4 - 14x^2 + 9 = 0$ (b) $x^4 + 14x^2 + 9 = 0$ (c) $x^4 - 14x + 9 = 0$ (d) $x^4 + 14x^2 - 9 = 0$

35) If 3 is a double root of the equation $8x^3 - 47x^2 + 66x + 9 = 0$ then the third root is _____

(a) $-\frac{1}{8}$ (b) $\frac{1}{8}$ (c) 8 (d) -8

36) If α, β, γ are roots of $x^3+2x-6 = 0$ then the value of $\alpha\beta\gamma$ is _____

(a) 0 (b) 2 **(c) 6** (d) -4

37) If the product of the roots of $3x^4 - 4x^3 + 2x^2 + x + a = 0$ is 21, then the value of a is _____

(a) 7 (b) -7 (c) -63 **(d) 63**

38) If α, β, γ and δ are the roots of the equation $x^4 + px^3 + qx^2 + rx + s = 0$ then the value of $\sum \frac{1}{\alpha}$ is _____

(a) $\frac{s}{r}$ (b) $-\frac{S}{r}$ (c) $\frac{r}{s}$ **(d)** $-\frac{r}{s}$

39) If α, β, γ are the roots of the equation $x^3 + ax - b = 0$ then the value of $\sum \left(\frac{\alpha}{\beta\gamma}\right)$ _____

(a) $\frac{a}{b^2}$ **(b)** $-\frac{2a}{b}$ (c) $\frac{2a}{b}$ (d) $\frac{b^2}{a}$

40) The sum of the squares of the roots of $x^3 + ax^2 - bx + c = 0$ is _____

(a) $a^2 + 2b$ **(b)** $a^2 + 2b$ (c) $b^2 - 2c$ (d) $a^2 + 2c$

41) If the roots of the equation $4x^3 - 24x^2 + 23x + 18 = 0$ are a-d, a and a+d then the value of a is _____

(a) 2 (b) 8 (c) 6 (d) -2

42) If a is a root of $x^4 - 2x^3 + 6x^2 + 2x - 1 = 0$, then _____

(a) -a is also a root 1 **(b)** $\frac{1}{a}$ **is also a root** (c) 1 is a also a root (d) None of these

43) If the roots of the equation $x^3 - x^2 - 4x + 4 = 0$ are 1, -2, 2 then the roots of $4x^3 - 4x^2 - x + 1 = 0$ are _____

(a) 1, -2, 2 **(b)** $1, -\frac{1}{2}, \frac{1}{2}$ (c) 1, 1, -2 (d) -1 , -2, 2

44) A reciprocal equation a of $a_0x^n + a_1x^{n-1} + \ldots + a^n = 0$ is said to be of second type if _____

(a) $a_{n-r} = a_{r-1}$ (b) $a_{n-r} = a_{r+1}$ **(c)** $a_{n-r} = -a_r$ (d) $a_{n-r} = a_r$

45) If α, β, γ are the roots $x^3 + 3x^2 + x - 4 = 0$, then the equation whose roots are $10\alpha, 10\beta, 10\gamma$ is _____

(a) $x^3 + 30x^2 + 10x - 40 = 0$ **(b)** $x^3 + 30x^2 + 100x - 4000 = 0$ (c) $4x^3 + 12x^2 + 4x - 1 = 0$

(d) $10x^3 + 30x^2 + 10x - 1 = 0$