QUESTION BANK

EXERCISE - 1

Q.1 Find the quadratic polynomial with the sume and the product of its zeros as 1/4 and −1 respectively.

Q.2 Verify that $3, -1, -\frac{1}{3}$ are the zeroes are the zeroes of the cubic polynomial $p(x) = 3x^3 - 5x^2 - 11x - 3$, and then verify the relationship between the zeroes and the coefficients.

Q.3 Verify that 2, 1, –1 are the zeros of $x^3 - 2x^2 - x + 2$. Also verify the relationship. between the zeros and the coefficients.

Q.4 Find the zeroes of the quadratic polynomial $6x^2 - 3 - 7x$ and verify the relationship between the zeroes and the coefficients.

Q.5 Find the zeroes of the quadratic polynomial $x^2 + 7x + 10$, and verify the relationship between the zeroes and the coefficients.

Q.6 Find a quadratic polynomial, the sum and product of whose zeroes are – 3 and 2, respectively.

Q.7 Divide $3x^2 - x^3 - 3x + 5$ by $x - 1 - x^2$, and verify the division algorithm.
In this way, the division algorithm is verified.

Q.8 Factorise : $81\,a^2b^2c^2 + 64\,a^6b^2 - 144\,a^4b^2c$

Q.9 Factorise : $\left(3a - \frac{1}{b}\right)^2 - 6\left(3a - \frac{1}{b}\right) + 9 + \left(c + \frac{1}{b} - 2a\right)\left(3a - \frac{1}{b} - 3\right)$

Q.10 Factorise : $4\,(2a + 3b - 4c)^2 - (a - 4b + 5c)^2$

Q.11 Factorise : $4x^2 + \frac{1}{4x^2} + 2 - 9y^2$

Q.12 Factorise : $a^4 + \frac{1}{a^4} - 3$

Q.13 Factorise : $x^4 + x^2y^2 + y^4$

Q.14 Factorise : $64\,a^{13}b + 343ab^{13}$

Q.15 Factorise : $p^3q^2x^4 + 3p^2qx^3 + 3px^2 + \frac{x}{q} - q^2r^3x$

Q.16 Factorise : $x^3 - 6x^2 + 32$

Q.17 Factorise : $a^3 + b^3 + c^3 - 3abc$

Q.18 Factorise : $a^6 + 4a^3 - 1$

Q.19 Factorise : $(a^2 - b^2)^3 + (b^2 - c^2)^3 + (c^2 - a^2)^3$

Q.20 Factorise : $y^4 + y^2 - 2ay + 1 - a^2$

EXERCISE - 2

Fill in the Blanks :

Q.1 Polynomials of degrees 1, 2 and 3 are called ...., ... and .... polynomials respectively.

Q.2 The zeroes of a polynomial p(x) are precisely the x-coordinates of the points, where the graph of y = p(x) intersects the ....axis.

Q.3 A quadratic polynomial can have at most 2 zeroes and a cubic polynomial can have at most .... zeroes.

Q.4 If α and β are the zeroes of the quadratic polynomial $ax^2 + bx + c$, then $\alpha + \beta = \frac{-b}{\ldots\ldots}$ & $\alpha\beta = \frac{c}{\ldots\ldots}$

Q.5 If α, β, γ are the zeroes of the cubic polynomial $ax^3 + bx^2 + cx + d = 0$, then $\alpha + \beta + \gamma = \frac{-b}{\ldots\ldots}$

True-False statements –

Q.6 For polynomials p (x) and any non-zero polynomial g(x), there are polynomials q (x) and r (x) such that p (x) = g (x) q (x) + r (x), where r (x) = 0 or degree r (x) < degree g (x).

Q.7 Sum of zeroes of quadratic polynomial $= -\frac{(\text{coefficient of } x)}{(\text{coefficient of } x^2)}$

Q.8 Product of zeroes of quadratic polynomial = $-\dfrac{\text{constant term}}{(\text{coefficient of } x^2)}$

Q.9 Divided = Divisor × Quotient + Remainder

Q.10 3, –1, 1/3 are the zeroes of the cubic polynomial $p(x) = 3x^3 - 5x^2 - 11x - 3$.

Q.11 Zeroes of quadratic polynomial $x^2 + 7x + 10$ are 2 and –5

Q.12 Sum of zeroes of $2x^2 - 8x + 6$ is – 4

EXERCISE - 3

Q.1 When $(x^5 + 1)$ is divided by $(x - 2)$, the remainder is –
(A) 5 (B) 17 (C) 31 (D) 33

Q.2 If the expression $(x^2 - x + c)$ when divided by $(x + 1)$ leaves remainder 3, then the value of c is –
(A) 0 (B) 1 (C) 2 (D) 3

Q.3 If $(x + 1)$ and $(x - 2)$ are the factors of the expression $(2x^3 - px^2 + x + q)$, then the values of p and q are given by –
(A) p = 5, q = 2 (B) p = 7, q = 8 (C) p = 7, q = 10 (D) p = 15, q = 12

Q.4 The value of x, for which the polynomials $x^2 - 1$ and $x^2 - 2x + 1$ vanish simulatneously, is –
(A) 2 (B) –2 (C) –1 (D) 1

Q.5 The value of k for which the polynomial $2x^3 - x^2 + 3x - k$ is divisible by $(x - 1)$ is –
(A) 1 (B) 2 (C) 3 (D) 4

Q.6 A positive integer is said to be a prme if it is not divisible by any positive integer other than itself and one. Let p be a prime number strictly greater than 3. Then, when $p^2 + 17$ is divided by 12, the remainder is –
(A) 6 (B) 1 (C) 0 (D) 8

Q.7 The value of the polynomial $x^8 - x^5 + x^2 - x + 1$ is –
(A) positive for all the real numbers (B) negative for all the real numbers
(C) 0 (D) depends on value of x

Q.8 If one root of the polynomial $5x^2 + 13x + k$ is reciprocal of the other, then the value of k is –
(A) 0 (B) 5 (C) 6 (D) 1/6

Q.9 The quotient when $3x^4 - 5x^3 + 10x^2 + 11x - 61$ divided by $(x - 3)$ is
(A) $3x^3 + 4x^2 + 22x + 77$ (B) $77x^3 + 22x^2 + 4x + 3$
(C) $3x^2 + 4x^3 + 22x + 77$ (D) None of these

Q.10 If $x = 0.\overline{7}$, then 2x is –
(A) $1.\overline{4}$ (B) $1.\overline{5}$ (C) $1.\overline{54}$ (D) $1.\overline{45}$

Q.11 If the expression $16x^4 - 24x^3 + 41x^2 - nx + 16$ is a perfect square, then the value of n is –
(A) –12 (B) 12 (C) –24 (D) 24

Q.12 Lowest value of $x^2 + 4x + 2$ is –
(A) 0 (B) –2 (C) 2 (D) 4

Q.13 Maximum value of $2 - 4x - x^2$ is –
(A) 2 (B) 4 (C) 6 (D) 8

Q.14 A quadratic polynomial when divided by x + 2 leaves a remainder of 1 and when divided by x – 1, leaves a remainder of 4. What will be the remainder if it is divided by (x + 2) (x – 1) –
(A) 1 (B) 4 (C) x + 3 (D) x – 3

Q.15 If (x + 1) is a factor of $x^2 - 3ax + 3a - 7$, then the value of a is –
(A) 1 (B) –1 (C) 0 (D) –2

Q.16 If α, β, γ be the zeroes of the polynomial $ax^2 + bx^2 + cx + d$, then the value of $\alpha\beta + \beta\gamma + \gamma\alpha$ is –
(A) –b/a (B) c/a (C) –c/a (D) d/a

Q.17 If α, β are the zeroes of the polynomial $f(x) = x^2 - p(x + 1) - c$, then $(\alpha + 1)(\beta + 1)$ is equal to –

(A) 1 + c (B) 1 – c (C) c – 1 (D) c

Q.18 α, β, γ are the zeroes of the cubic polynomial $x^3 - 2x^2 + qx - 6$ is 4, then a is equal to –

(A) 3/2 (B) –3/2 (C) 2/3 (D) –2/3

EXERCISE - 4

Match the column–

Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in **column I** have to be matched with statements (p, q, r, s) in **column II**.

Q.1 Column II gives zeroes (not necessary all) of the polynomials given in column I, match them correctly.

Column I	Column II
(A) $4 - x^2$	(p) 7
(B) $x^3 - 2x^2$	(q) –2
(C) $6x^2 - 3 - 7x$	(r) 2
(D) $-x + 7$	(s) 3/2

Q.2 Column II gives polynomial (quadratic) for zeroes given in column I, match them correctly.

Column I	Column II
(A) 3 and –5	(p) $x^2 - 25$
(B) $5+\sqrt{2}$ and $5-\sqrt{2}$	(q) $x^2 + 2x - 15$
(C) – 9 and 1/9	(r) $x^2 + (80/9)x - 1$
(D) 5 and – 5	(s) $x^2 - 10x + 21$

Q.3 Column II give remainder for division of polynomial given in column I, match them correctly.

Column I	Column II
(A) $\dfrac{x^3 - 3x^2 + x + 2}{x^2 - x + 1}$	(p) 8
(B) $\dfrac{x^3 - 3x^2 + 5x - 3}{x + 2}$	(q) x – 5
(C) $\dfrac{x^4 - 6x^3 + 16x^2 - 25x + 10}{x^2 - 2x + 5}$	(r) – 33
(D) $\dfrac{x^4 - 3x^2 + 4x + 5}{x^2 - x + 1}$	(s) –2x + 4