MATHEMATICS
CLASS – X
POLYNOMIALS

Time: 1hours - 1½ hours **Maximum Marks: 50**

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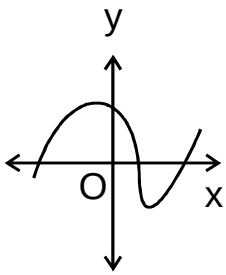
Q.1. (A) **The graph of y = p(x) is given. The number of zeros of p(x) are:** **(1)**



(i) 0 **(ii) 2** **(iii) 4** **(iv) 3**

(B) **If α and β are zeroes of $x^2 - 4x + 1$, then $\frac{1}{\alpha}+\frac{1}{\beta}-\alpha\beta$ is** **(1)**

(i) 3 **(ii) 5** **(iii) –5** **(iv) –3**

(C) **If one zero of $2x^2 - 3x + k$ is reciprocal to the other, then the value of k is,** **(1)**

(i) 2 **(ii) $\frac{-2}{3}$** **(iii) $\frac{-3}{2}$** **(iv) –3**

(D) **If one of the zeros of the quadratic polynomial $(k - 1)x^2 + kx + 1$ is –3, then the value of k is**

(i) $\frac{-4}{3}$ **(ii) $\frac{4}{3}$** **(iii) $\frac{2}{3}$** **(d) $\frac{-2}{3}$** **(1)**

(E) **The quadratic polynomial p(x) with –81 and 3 as product and one of zeros respectively is** **(1)**

(i) $x^2 + 24x - 81$ **(ii) $x^2 - 24x - 81$** **(iii) $x^2 - 24x + 81$** **(d) $x^2 + 24x + 81$**

Q.2. (A) **Verify the relation between zeros and coefficients of polynomial $f(x) = 4x^2 - 9$.** **(2)**

(B) **Find a quadratic polynomial whose zeros are 4 and 6.** **(2)**

(C) **Find a cubic polynomial whose zeros are $\frac{1}{2},\frac{1}{3},\frac{1}{4}$.** **(2)**

(D) **Find remainder if possible when $3x^4 - 4x^2 + 8x - 1$ is divide by x – 2** **(2)**

(E) **Find the zeros of polynomial $f(x) = 4x^2 - 3\sqrt{5x} - 35$.** **(2)**

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Q.3. **(A)** **Verify the relationship between zeros and coefficients of cubic polynomial $x^3 - 27x + 54$ if it is given that zeros of polynomial are –6, 3 and 3.** **(3)**

(B) **If α and β are zeros of quadratic polynomial $x^2 + x + -1$. Find value of** **(3)**

(i) $\alpha^2 - \beta^2$ (ii) $\alpha^3 + \beta^3$

(C) **On dividing $x^3 - 3x^2 + x + 2$ by a polynomial g(x), the quotient and remainder were $x - 2$ and $-2x + 4$, respectively. Find g(x).** **(3)**

(D) **If zeros of polynomial $x^3 - 3x^2 + x + 1$ are $a - b$, a and $a + b$. Find a and b.** **(3)**

(E) **Obtain all the zeros of $x^3 - 7x + 6$ if one of its zeros is 1.** **(3)**

Q.4. **(A)** **Obtain all the zeros of $3x^4 + 6x^3 - 2x^2 - 10x - 5$, if two its zeros are $\sqrt{\frac{5}{3}}$ and $-\sqrt{\frac{5}{3}}$.** **(4)**

(B) **If α, β are zeros of the polynomial $25p^2 - 15p + 2$, find a quadratic polynomial whose zeros are $\frac{\alpha}{\beta}$ & $\frac{\beta}{\alpha}$.** **(4)**

(C) **(i) If one zero of the equation $3x^2 = 8x + 2k + 1$ is seven times the other. Find the solutions and the value of k.** **(4)**

(ii) Draw graph of polynomial $x^2 - x - 6$. Also write the coordinate where it cuts x-axis.

(D) **(i) Verify relation between zeros and coefficients of $f(x) = t^2 - 90$.** **(4)**

(ii) If α and β are zeros of polynomial $x^2 - 5x + k$ such that $\alpha - \beta = 1$, find value of k.

Q.5. **If polynomial $x^4 - 6x^3 + 16x^2 - 25x + 10$ is divided by another polynomial $x^2 - 2x + k$, the remainder comes out to $x + a$, find k and a.** **(4)**