POLYNOMIALS

SECTION A: (1 MARK)

1. Form a quadratic polynomial whose zeroes are $\frac{2}{3}$ and $\frac{-1}{3}$. **(CBSE 2008)** $(9x^2 - 3x - 2)$
2. If -1 is a zero of the polynomial $f(x) = x^2 - 7x - 8$, then find the other zero. (8) **(CBSE 2012)**
3. If α and β are the zeroes of the polynomial $2x^2 + 5x + 1$, then what is the value of $\alpha + \beta + \alpha\beta$? (-2)
4. If the sum of the zeroes of the polynomial $P(x) = 3k^2 + (2k + 1)x - k + 5$ is equal to the product of the zeroes, then, find the value of k. (k = -6)
5. The graph of the polynomial $f(x) = 2x - 5$ is a straight line. At which point does the graph intersect the x-axis? **(CBSE 2012)** $\left(\frac{5}{2}, 0\right)$

SECTION B: (2 MARKS)

6. For what value of k, (-4) is a zero of the polynomial $x^2 - x - (2k + 2)$? **(CBSE 2009)** K = 9
7. If m and n are the zeroes of the polynomials $3x^2 + 11x - 4$, find the value of $\frac{m}{n} + \frac{n}{m}$. **(CBSE 2012)** $\left(\frac{-145}{12}\right)$
8. If the zeroes of the polynomial $x^2 + px + q$ are double in value to the zeroes of the polynomial $2x^2 - 5x - 3$, find the values of p and q. p = -5, q = -6.
9. Form a quadratic polynomial whose one zero is $3 + \sqrt{2}$ and the sum of zeroes is 6. $x^2 - 6x + 7$
10. If $ax^2 - 7x + c$ has 14 as the sum of the zeroes and also as product of the zeroes, find the value of a and c. **(HOTS)** a = ½ c = 7.

SECTION C: (3 MARKS)

11. Find the zeroes of the following polynomials by factorization method and verify the relations between the zeroes and the coefficients of the polynomial. **(EXEMPLAR)**

(i) $2x^2 - \left(1 + 2\sqrt{2}\right)x + \sqrt{2}$ (i)1/2, $\sqrt{2}$

(ii) $y^2 + \frac{3}{2}\sqrt{5}\,y - 5.$ (ii)$-2\sqrt{5}, \frac{\sqrt{5}}{2}$

12. Find the value of a and b so that $8x^4 + 14x^3 - 2x^2 + ax + b$ is exactly divisible by $4x^2 + 3x - 2$. **(CBSE 2011)** a= -7 b= 2.

13. If p and q are the zeroes of the polynomial $6y^2 - 7y + 2$, find a quadratic polynomial whose zeroes are $\frac{1}{p}$ and $\frac{1}{q}$. **(CBSE 2011)** $\frac{1}{2}(2y^2 - 7y + 6)$

14. On dividing a polynomial $3x^3 + 4x^2 + 5x - 13$ by a polynomial g(x), the quotient and the remainder were (3x + 10) and (16x – 43) respectively. Find g(x). **(CBSE 2011)** $x^2 - 2x + 3$

15. If one zero of a polynomial $3x^2 - 8x + 2k + 1$ is seven times the other, find the value of k. **(CBSE 2011)** K = 2/3.

SECTION D: (4 MARKS)

16. Find the other zeroes of the polynomial $P(x) = 2x^4 + 7x^3 - 19x^2 - 14x + 30$, if two of its zeroes are $\frac{3}{2}\ and\ -5$. **(CBSE 2011)**

$-\sqrt{2}, \sqrt{2}$

17. Given $\sqrt{2}$ is a zero of the cubic polynomial $6x^3 + \sqrt{2}x^2 - 10x - 4\sqrt{2}$, find the other two zeroes.

$\frac{-\sqrt{2}}{2}, \frac{-2\sqrt{2}}{3}$

18. If the polynomial $x^4 - 6x^3 + 16x^2 - 25x + 10$ is divided by another polynomial $x^2 - 2x + k$, the remainder comes out to be x + a, find the values of k and a.

K = 5
a = -5.

19. If the remainder on division of $x^3 + 2x^2 + kx + 3\ by\ (x - 3) is\ 21$, find the quotient and the value of k. Hence find the zeroes of the cubic polynomial $x^3 + 2x^2 + kx - 18$. **(EXEMPLAR)**

k = -9
Quotient = $x^2 + 5x + 6$
Zeroes: 3,-2, -3

20. If $\alpha\ and\ \beta$ are the zeroes of the polynomial $p(x) = 2x^2 + 5x + k$ satisfying the relation $\alpha^2 + \beta^2 + \alpha\beta = \frac{21}{4}$, then find the value of k.

k = 2.