Assignment : Chapter 2

Q1. Factorize the following by using middle term splitting method:

(a) $x^2 + 7x + 12$

(b) $6x^2 - 3$

(c) $abx^2 + (b^2 - ac)x - bc$

(d) $x^2 - 2x - 8$

(e) $x^2 - 5x + 4$

(f) $5y^2 - 7y + 2$

(g) $6x^2 + x - 2$

Q2. Divide:

(i) Divide $2x^2 + 3x + 1$ by $x + 2$.

(ii) Divide $3x^3 + x^2 + 2x + 5$ by $1 + 2x + x^2$.

(iii) Divide $3x^2 – x^3 – 3x + 5$ by $x – 1 – x^2$

(iv) Divide $x^3 – 3x^2 + 5x – 3$, *by* $x^2 – 2$

Q3. Solve;

(i) If α and β are the zero of the quadratic polynomial $f(x) = x^2 - px + q$, then find the value of $\alpha^2 + \beta^2$.

(ii) If α and β are the zero of the quadratic polynomial $f(x) = x^2 - px + q$, then find the value of $\frac{1}{\alpha} + \frac{1}{\beta}$.

(iii) If α and β are the zero of the quadratic polynomial $f(x) = ax^2 - bx + c$, then evaluate of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$.

(iv) If α and β are the zero of the quadratic polynomial $f(x) = ax^2 - bx + c$, then evaluate of $\alpha^2 + \beta^2$.

(v) If α and β are the zero of the quadratic polynomial $f(x) = ax^2 - bx + c$, then evaluate of $\alpha^3 + \beta^3$.

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

Q4. Find all the zeroes of $2x^4 – 3x^3 – 3x^2 + 6x – 2$, if you know that two of its zeroes are 2 and $-\sqrt{2}$.

Q5. Obtain all other zeroes of $3x^4 + 6x^3 – 2x^2 – 10x – 5$, if two of its zeroes are $\sqrt{\frac{5}{3}}$ and $-\sqrt{\frac{5}{3}}$.

Q6. 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 $g(x)$.

Q7. If the zeroes of the polynomial $x^3 - 3x^2 + x + 1$ are $a - b$, a, $a + b$, find a and b.

Q8. If α and β are the zero of the quadratic polynomial $f(x) = kx^2 + 4x + 4$, such that $\alpha^2 + \beta^2 = 24$, find the value of k.

Q9. If sum of the square of zeroes of the quadratic polynomial $f(x) = x^2 - 8x + k$ is 40, find the value of k.

Q10. If α and β are the zeroes of the polynomial $2x^2 - 7x + 3$. Find the sum of the reciprocal of its zeroes.

Q11. If α, β are the zeroes of the polynomial $p(x) = x^2 - a(x + 1) - b$ such that $(\alpha + 1)(\beta + 1) = 0$ then find value of b.

Q12. If α, β are the zeroes of the polynomial $x^2 - (k + 6)x + 2(2k - 1)$. Find k if $\alpha + \beta = \frac{1}{2}\alpha\beta$.

Q13. If $(x + p)$ is a factor of the polynomial $2x^2 + 2px + 5x + 10$ find p.

Q14. Find a quadratic polynomial whose zeroes are $(5 - 3\sqrt{2})$ and $(5 + 3\sqrt{2})$.

Q15. If $\frac{1}{5}$ and -2 are respectively product and sum of the zeroes of a quadratic polynomial. Find the polynomial.

Q16. If one of the zero of the polynomial $g(x) = (k^2 + 4)x^2 + 13x + 4k$ is reciprocal of the other, find k.

Q17. If α, β be the zeroes of the quadratic polynomial $2 - 3x - x^2$ then find the value of $\alpha + \beta(1 + \alpha)$.

Q18. Form a quadratic polynomial, one of whose zero is $(2 + \sqrt{5})$ and the sum of zeroes is 4.

Q19. If sum of the zeroes of $kx^2 + 3k + 2x$ is equal to their product. Find k.

Q20. If one zero of $4x^2 - 9 - 8kx$ is negative of the other, find k.

Q21. Find the quadratic polynomial whose zeroes are 2 and –3. Verify the relation between the coefficients and the zeroes of the polynomial.

Q22. If one zero of the polynomial $(a^2 + a)x^2 + 13x + 6a$ is reciprocal of the other, find value (s) of a.

Q23. –5 is one of the zeroes of $2x^2 + px - 15$. Quadratic polynomial $p(x^2 + x) + k$ has both the zeroes equal to each other. Then find k.

Q24. What should be subtracted from the polynomial $2x^3 + 5x^2 – 14x + 10$ so that the resultant polynomial is a multiple of $(2x – 3)$.

Q25. If $f(x) = 2x^4 – 5x^3 + x^2 + 3x – 2$ is divided by $g(x)$, the quotient is $q(x) = 2x^2 – 5x + 3$ and $r(x) = – 2x + 1$ find $g(x)$.

Q26. If $(x – 2)$ is one of the factors of $x^3 – 3x^2 – 4x + 12$, find the other zeroes.

Q27. If α and β are the zeroes of the polynomial $x^2 – 5x + k$ such that $\alpha – \beta = 1$, find the value of k.

Q28. If α, β are zeroes of quadratic polynomial $2x2 + 5x + k$, find the value of k, such that $(\alpha + \beta)2 – \alpha\beta = \frac{21}{4}$.

Q29. Obtain all zeroes of $x^4 – x^3 –7x^2 + x + 6$ if 3 and 1 are zeroes.

Q30. If the two zeroes of the polynomial $2x^4 – 2x^3 – px^2 + qx – 6$ are –1 and 2, find p and q.

Q31. If $(2 + 3)$ and $(2 – 3)$ are two zeroes of $x^4 – 4x^3 – 8x^2 + 36x – 9$ find the other two zeroes.

Q32. What must be subtracted from $8x^4 + 14x^3 – 2x^2 + 7x – 8$ so that the resulting polynomial is exactly divisible by $4x^2 + 3x – 2$.

Q33. When we add $p(x)$ to $4x^4 + 2x^3 – 2x^2 + x – 1$ the resulting polynomial is divisible by $x^2 + 2x – 3$ find $p(x)$.

Q34. Find a and f if $(x^4 + x^3 + 8x^2 + ax + f)$ is a multiple of $(x^2 + 1)$.

Q35. If the polynomial $6x^4 + 8x^3 + 17x^2 + 21x + 7$ is divided by $3x^2 + 1 + 4x$ then $r(x) = (ax + b)$ find a and b.

Q36. Find the zeroes of the quadratic polynomial $x^2 + 7x + 10$, and verify the relationship between the zeroes and the coefficients.

Q37. Find the zeroes of the polynomial $x^2 – 3$ and verify the relationship between the zeroes and the coefficients.

Q38. Find a quadratic polynomial, the sum and product of whose zeroes are – 3 and 2, respectively.

Q39. If two zeroes of the polynomial $x^4 – 6x^3 – 26x^2 + 138x – 35$ are 2 ± 3, find other zeroes.

Q40. If the polynomial $x^4 – 6x^3 + 16x^2 – 25x + 10$ is divided by another polynomial $x2 – 2x + k$, the remainder comes out to be $x + a$, find k and a.