1) Find the zeros of the polynomial (a) $x^2 + 7x + 10$ (b) $x^2 - 1$

2) Factorize: a) $999^2 - 1$ b) $(10.2)^3$ c) $1002 X 998$

3) Factorize: a) $x^3 - 3x^2 - 9x - 5$ b) $x^3 + 7x^2 - 21x - 27$

4) Factorize: (a) $3x^2 + 27y^2 + z^2 - 18xy + 6v3yz - 2v3xz$ (b) $27x^3 + 125y^3$ (c) $(2a - 3b + c)^2$

5) Using factor theorem, Show that (a - b) is the factor of $a(b^2-c^2) + b(c^2-a^2) + c(a^2-b^2)$

6) Factorize: (a) $4v3x^2 + 5x - 2v3v$ (b) $21x^2 - 2x + 1/21$ (c) $9(2a - b)^2 - 4(2a - b) - 13$

7) Simplify and factorise $(a + b + c)^2 - (a - b - c)^2 + 4b^2 - 4c^2$

8) Factorise: $(a^2 - b^2)^3 + (b^2 - c^2)^3 + (c^2 - a^2)^3$

9) For what value of $a$ is $2x^3 + ax^2 + 11x + a + 3$ exactly divisible by $(2x - 1)$

10) If $x - 2$ is a factor of a polynomial $f(x) = x^5 - 3x^4 - ax^3 + 3ax^2 + 2ax + 4$, then find the value of $a$

11) Find the value of $a$ and $b$ so that $x^2 - 4a$ is a factor of $ax^4 + 2x^3 - 3x^2 + bx - 4$ .

12) If $x = 2$ and $x = 0$ are zeroes of the polynomial $2x^5 - 5x^2 + px + b$, then find the value of $p$ and $b$

13) Find the value of $a$ and $b$ so that polynomial $x^3 - ax^2 - 13x + b$ is exactly divisible by $(x-1)$ as well as $(x+3)$

14) The polynomial $x^3 - mx^2 + 4x + 6$ when divided by $(x+2)$ leaves remainder 14 find the value of $m$

15) If the polynomial $ax^3 + 3x^2 - 13$ and $2x^5 - 5x^2 + px + b$ when divided by $(x - 2)$ leave the same remainder, find the value of $a$

16) If both $(x - 2)$ and $(x - 3)$ are factors of $px^3 + 5x + r$, show that $p = r$

17) If $f(x) = x^3 - 2x^2 + 3x^2 - ax + b$ is divided by $(x-1)$ and the remainder obtained is $5$ and $6$ through $x=1$ and $x=1$ the remainders obtained are 5 and 19 respectively, then find $a$ and $b$

18) If $a$ and $B$ be the remainders when the polynomials $x^3 + 2x^2 - 5ax - 7$ and $x^2 + 4x^2 - 12x + 6$ are divided by $(x+1)$ and $(x-2)$ respectively and $2A + B = 6$, find the value of $a$

19) Show that $x+1$ and $2x-3$ are factors of $2x^3 - 9x^2 + x + 12$

20) If sum of remainders obtained by dividing $ax^3 - 3ax^2 + 7x + 5$ by $(x-1)$ and $(x+1)$ is -36 find the value of $a$

21) By using suitable identity, find the value of:
   (a) $(-6)^3 + 13^3 - (-7)^3$ (b) $-21^3 + 28^3$ (c) $9.8^3 - (11.3)^3 + (1.5)^3$ (d) $(8/15)^3 - (-1/3)^3 + (-1/5)^3$

22) Find the remainder when $9x^3 - 3x^2 + x - 5$ is divided by $x - 2$

23) Find the remainder when $x^{51} + 51$ is divided by $x + 1$

24) Find the remainder when $x^3 - px^2 + 6x - p$ is divided by $(x - p)$

25) Find the value of $x + y^3 + 15xy - 125$ when $x + y = 5$

26) Find the value of $p^3 - q^3$, if $p - q = 5/7$ and $p + q = 7/3$

27) If $a + b + c = 8$, $a^2 + b^2 + c^2 = 30$. Find the value of $a + b + c$ and $a$

28) If $2x + 3y = 13$ and $x + y = 6$ then, find $8x^3 + 27y^3$

29) Find the value of $a^3 + b^3 + c^3 - 3abc$, when $a + b + c = 8$ and $a + b + c + c = a = 25$

30) Find the value of $x^3 + y^3 + z^3 - 3xyz$, if $x + y + z = 12$ and $x^2 + y^2 + z^2 = 70$

31) If $x + y + z = 1$, $x y + y z + z x = -1$ and $x y z = -1$, find the value of $x^3 + y^3 + z^3$

32) If $(a + b + c) = 2a^2 + 2b^2$, show that $a = b$

33) If $(a + b + c) = 0$, then prove that $a^3 + b^3 + c^3 = 3abc$

34) Prove that $2x^3 + 2y^3 + 2z^3 - 6xyz = (x + y + z) [(x - y)^2 + (y - z)^2 + (z - x)^2]$

35) Give possible expressions for the length and breadth of each of the following rectangles, in which their areas are given

36) Simplify: $\frac{x + y}{3}^3 - \frac{x - y}{5}^3$

37) Simplify: $(a + b + c)^2 + (a - b + c)^2 + (a + b - c)^2$

38) What must be subtracted from $4x^4 - 2x^2 - 6x + x - 5$, so that the result is exactly divisible by $2x^2 + x - 1$?

39) Find the dimensions of a cuboid, whose volume is $2py^2 + 6py - 20p$

40) If $p(x) = x^2 - 4x + 3$, evaluate $p(2) - p(-1) + p(1/2)$
41) Maximum number of zeroes in a cubic polynomial are:
   a) 0        b) 1        c) 2        d) 3

42) common factor in quadratic polynomials \(x^2 + 8x + 15\) and \(x^2 + 3x - 10\) is:
   a) \(x + 3\)        b) \(x + 5\)        c) \(x - 5\)        d) \(x - 3\)

43) Which of the following is a polynomial in \(y\)?
   a) \(y^2 + \sqrt{2}\)   b) \(y + 1/y + 2\)   c) \(\sqrt{y} + \sqrt{2y}\)   d) \(y \sqrt{y} + 1\)

44) If \(x^3 + 6x^2 + 4x + k\) is exactly divisible by \(x + 2\), then \(k\) is equal to:
   a) –6        b) –7        c) –8        d) –10