Q1. Factorise: **2 Marks**
$6x^2 - 11x - 35$

Q2. Write the following in the expanded form: **2 Marks**
$(2x - y + z)^2$

Q3. Evaluate the following products without multiplying directly: **2 Marks**
103×107

Q4. Simplify: **2 Marks**
$3\sqrt{45} - \sqrt{125} + \sqrt{200} - \sqrt{50}$

Q5. Factorise: **2 Marks**
$x^2 - x - 156$

Q6. Factorise: **2 Marks**
$2\sqrt{2}a^3 + 16\sqrt{2}b^3 + c^3 - 12abc$

Q7. Evaluate: **2 Marks**
$(0.2)^3 - (0.3)^3 + (0.1)^3$

Q8. Express the following in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$: **2 Marks**
$5.\overline{2}$

Q9. Factorise: **2 Marks**
$16x^4 - 1$

Q10. Factorise: **2 Marks**
$1029 - 3x^3$

Q11. Factorise: **2 Marks**
$x^2 - 4x + 3$

Q12. Factorise: **2 Marks**
$216x^3 + \frac{1}{125}$

Q13. Factorize: **2 Marks**
$x^2 - 2\sqrt{2}x - 30$

Q14. Expand: **2 Marks**
$(-3a + 4b - 5c)^2$

Q15. Without actually calculating the cubes, find the value of: **2 Marks**
$\left(\frac{1}{2}\right)^3 + \left(\frac{1}{3}\right)^3 - \left(\frac{5}{6}\right)^3$

Q16. Factorise: **2 Marks**
$1 + \frac{27}{125}a^3 + \frac{9a}{5} + \frac{27a^2}{25}$

Q17. Factorise: **2 Marks**
$a^3 - 8b^3 - 64c^3 - 24abc$

Q18. If $a^2 + b^2 + c^2 = 250$ and $ab + bc + ca = 3$, find $a + b + c$. **2 Marks**

Q19. Factorise: **2 Marks**
$x^2 - 21x + 90$

Q20. Factorise: **2 Marks**
$\sqrt{2}x^2 + 3x + \sqrt{2}$

Q21. Factorise the following: **3 Marks**
$27p^3 - \frac{1}{216} - \frac{9}{2}p^2 + \frac{1}{4}$

Q22. Evaluate the following: **3 Marks**
$(99)^3$

Q23. Factorise the following: **3 Marks**
$64a^3 - 27b^3 - 144a^2b + 108ab^{2</}$

Q24. Find the following products: **3 Marks**
$(3x - 4y + 5z)(9x^2 + 16y^2 + 25z^2 + 12xy - 15zx + 20yz)$

Q25. Find the value of $\frac{4}{(216)^{-\frac{2}{3}}} + \frac{1}{(256)^{-\frac{3}{4}}} + \frac{2}{(243)^{-\frac{1}{5}}}$ **3 Marks**

Q26. Find the values of a and b if: **4 Marks**
$\frac{7+3\sqrt{5}}{3+\sqrt{5}} - \frac{7-3\sqrt{5}}{3-\sqrt{5}} = a + b\sqrt{5}$

Q27. Find the integral roots of the polynomial $f(x) = x^3 + 6x^2 + 11x + 6$ **4 Marks**

Q28. In the following, using the remainder theorem, find the remainder when f(x) is divided by g(x) and verify the by actual division: **4 Marks**
$f(x) = 4x^4 - 3x^3 - 2x^2 + x - 7$, $g(x) = x - 1$

Q29. If $x^2 + \frac{1}{x^2} = 79$, find the value of $x + \frac{1}{x}$. **4 Marks**

Q30. Points A(5, 3), B(-2, 3) and D(5, -4) are three vertices of a square ABCD. Plot these points on a graph paper and hence find the coordinates of the vertex C. **4 Marks**

Q31. If $x + y + z = 8$ and $xy + yz + zx = 20$, find value of $x^3 + y^3 + z^3 - 3xyz$. **4 Marks**

Q32. Find the value of the following correct to three place of decimals, it begin that **4 Marks**
$\sqrt{2} = 1.4142, \sqrt{3} = 1.732, \sqrt{5} = 2.2360, \sqrt{6} = 2.4495$ and $\sqrt{10} = 3.162$.
$\frac{3-\sqrt{5}}{3+2\sqrt{5}}$

Q33. If $\frac{9^n \times 3^2 \times \left(3^{\frac{-n}{2}}\right)^{-2} - (27)^n}{3^{3m} \times 2^3} = \frac{1}{27}$, prove that m - n = 1. **4 Marks**

Q34. If $x = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ and $y = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ then find the value of $x^2 + y^2$. **4 Marks**

Q35. Find the value of $27x^3 + 8y^3$, if: **4 Marks**
$3x + 2y = 20$ and $xy = \frac{14}{9}$

Q36. If $a = 3 - 2\sqrt{2}$, find the value of $a^2 - \frac{1}{a^2}$. **4 Marks**

Q37. Find the value of $64x^3 - 125z^3$, if $4x - 5z = 16$ and $xz = 12$. **4 Marks**

Q38. If $a + b = 10$ and $ab = 16$, find the value of $a^2 - ab + b^2$ and $a^2 + ab + b^2$. **4 Marks**

Q39. Represent $\sqrt{9.3}$ on the number line. **4 Marks**

Q40. Simplify: **4 Marks**

$$\frac{2\sqrt{6}}{\sqrt{2}+\sqrt{3}} + \frac{6\sqrt{2}}{\sqrt{6}+\sqrt{3}} - \frac{8\sqrt{3}}{\sqrt{6}+\sqrt{2}}$$

Q41. In which quadrant or on which axis do each of the points (-2, 4), (3, -1), (-1, 0), (1, 2) and (-3, -5) lie? Verify your answer by locating them on thCartesian plane. **4 Marks**

Q42. Evaluate: **4 Marks**

$(28)^3 + (-15)^3 + (-13)^3$

Q43. Simplify: **4 Marks**

$(2x + p - c)^2 - (2x - p + c)^2$

Q44. Simplify: **4 Marks**

$$\left(\frac{x^{a+b}}{x^c}\right)^{a-b}\left(\frac{x^{b+c}}{x^a}\right)^{b-c}\left(\frac{x^{c+a}}{x^b}\right)^{c-a}$$

Q45. Using factor theorem, factorize the following polynomials: **4 Marks**

$x^3 - 23x^2 + 142x - 120$

Q46. If $3x - 7y = 10$ and $xy = -1$, find the value of $9x^2 + 49y^2$. **4 Marks**

Q47. Find the values of a and b in the following: **4 Marks**

$$\frac{7+\sqrt{5}}{7-\sqrt{5}} - \frac{7-\sqrt{5}}{7+\sqrt{5}} = a + \frac{7}{11}\sqrt{5}b$$

Q48. Simplify $\left[\left\{(625)^{\frac{1}{2}}\right\}^{-\frac{1}{4}}\right]^2$ **4 Marks**

Q49. If $a + b + c = 9$ and $ab + bc + ca = 26$, find value of $a^3 + b^3 + c^3 - 3abc$. **4 Marks**

Q50. For any positive real number x, find the value of $\left(\frac{x^a}{x^b}\right)^{a+b} \times \left(\frac{x^b}{x^c}\right)^{b+c} \times \left(\frac{x^c}{x^a}\right)^{c+a}$ **4 Marks**

Q51. Locate $\sqrt{8}$ on the number line. **4 Marks**

Q52. In which quadrant or on which axis each of the following points lie? **4 Marks**

(-3, 5), (4, -1), (2, 0), (2, 2), (-3, -6)

Q53. Express $0.6 + 0.\overline{7} + 0.4\overline{7}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$. **5 Marks**