1. Factorise the following expressions:

(i) 7x – 42 (ii) 6p − 12q (iii) 7a2 + 14a (iv) −16z + 20z^3 (v) 20 l2 m + 30 a l m

(vi) 5x2y − 15xy^2 (vii) 10a2 − 15b2 + 20c^2 (viii) −4a2 + 4ab − 4 ca

(ix) x2 y z + xy2z + xyz2 (x) ax2y + bxy2 + c xyz

2. Factorize: (i) x2 + x y + 8x + 8y (ii) 15xy − 6x + 5y – 2 (iii) ax + b x − ay – by

(iv)15pq + 15 + 9q + 25p (v) z − 7 + 7xy – xyz

3. Add: 7xy + 5yz – 3 z x , 4yz + 9zx – 4 y , –3xz + 5 x – 2xy.

4. Subtract (i) 5x2 – 4y2 + 6y – 3 from 7x2 – 4xy + 8y2 + 5 x – 3y.

(ii) Subtract 4p2q – 3pq + 5pq2 – 8p + 7q – 10 from 18 – 3p – 11q + 5pq – 2pq2 + 5p2q

5. Find the product (i) 2x (3x + 5xy) (ii) a2 (2ab – 5c)

6. Simplify the expressions and evaluate them as directed:

(i) x (x – 3) + 2 for x = 1, (ii) 3y (2y – 7) – 3 (y – 4) – 63 for y = –2

7. Add (i) 5m (3 – m) and 6m2 – 13m (ii) 4y (3y2 + 5y – 7) and 2 (y3 – 4y2 + 5)

8. Simplify (a + b) (2a – 3b + c) – (2a – 3b) c.

9. Simplify.(i) (x2 – 5) (x + 5) + 25 (ii) (a2 + 5) (b3 + 3) + 5 (iii) (t + s2) (t2 – s)

(iv) (a + b) (c – d) + (a – b) (c + d) + 2 (ac + b d) (v) (x + y)(2x + y) + (x + 2y)(x – y)

(vi) (x + y)(x2 – xy + y2) (vii) (1.5x – 4y)(1.5x + 4y + 3) – 4.5x + 12y (viii) (a + b + c)(a + b – c)

10.Simplify.(i) (a2 – b2)2 (ii) (2x + 5)2 – (2x – 5)2 (iii) (7m – 8n)2 + (7m + 8n)2

(iv) (4m + 5n)2 + (5m + 4n)2 (v) (2.5p – 1.5q)2 – (1.5p – 2.5q)2 (vi) (a b + b c)2 – 2ab2c

(vii) (m2 – n2m) 2 + 2m3n2

11. Show that. (I)(4pq + 3q) 2 – (4pq – 3q) 2 = $48pq^2$ (II) (a – b) (a + b) + (b – c) (b + c) + (c – a) (c + a)

= 0

12. Find product using algebraic formula (i) 103 × 104 (ii) 5.1 × 5.2 (iii) 103 × 98 (iv) 9.7 × 9.8

13. If (x + 1 / x) = 4, Find the value of (x2 + 1 / x2) and (x4 + 1 / x4)

14. If $(x - \frac{1}{x}) = 3$ .Find the value of (x3 + 1 / x3)

15. What must be subtracted from 4p2- 2pq - 6q2 - r + 5 to get - p2 + p q - 8q2 – 2 r + 5

16. Evaluate (i) (23x+1 + 10) ÷ 7 = 6 (ii) 52x+1 ÷ 25 = 125

17. Find the value of x2+y2 if x +y =12 and x y= 14

18. By division show that x-1 is factor of x3-1

19. Factories: (i) 25-a2-b2-2ab (ii) x2 − 12x + 27

20. $(x^4 + 1 / x^4) = 47$ find the value of (x3 + 1 / x3)

21. Find the product of (x4 + 1 / x4) and (x + 1 / x)

22. Divide (I) x3- 1 by (x – 1) (ii) 7 +15x -1 by 3x2 +5x3 by 4 - 3x + x2

24. (i) If $a^2 + b^2 + c^2 = 20$, a + b + c = 6 find a b + b c + ca (ii) Factorise 5 k2 + 40k + 75