

**CHAPTER-19****FUNDAMENTAL OPERATIONS****QUESTION BANK****AVERAGE LEVEL**

1. Fill in the blanks:

(i)  $8x + 5x = \dots\dots$

(ii)  $8x - 5x = \dots\dots$

(iii)  $6xy^2 + 9xy^2 = \dots\dots$

(iv)  $6xy^2 - 9xy^2 = \dots\dots$

(v) The sum of  $8a$ ,  $6a$  and  $5b = \dots\dots$

(vi) The addition of  $5$ ,  $7xy$ ,  $6$  and  $3xy = \dots\dots$

(vii)  $4a + 3b - 7a + 4b = \dots\dots$

(viii)  $-15x + 13x + 8 = \dots\dots$

(ix)  $6x^2y + 13xy^2 - 4x^2y + 2xy^2 = \dots\dots$

(x)  $16x^2 - 9x^2 = \dots\dots$  and  $25xy^2 - 17xy^2 = \dots\dots$

2. Add:

(i)  $-9x$ ,  $3x$  and  $4x$

(ii)  $23y^2$ ,  $8y^2$  and  $-12y^2$

(iii)  $18pq$ ,  $-15pq$  and  $3pq$

3. Simplify:

(i)  $3m + 12m - 5m$

(ii)  $7n^2 - 9n^2 + 3n^2$

(iii)  $25zy - 8zy - 6zy$

(iv)  $-5ax^2 + 7ax^2 - 12ax^2$

(v)  $-16am + 4mx + 4am - 15mx + 5am$

**4. Add:**

- (i)  $a + b$  and  $2a + 3b$
- (ii)  $2x + y$  and  $3x - 4y$
- (iii)  $-3a + 2b$  and  $3a + b$
- (iv)  $4 + x$ ,  $5 - 2x$  and  $6x$

**5. Find the sum of:**

- (i)  $3x + 8y + 7z$ ,  $6y + 4z - 2x$  and  $3y - 4x + 6z$
- (ii)  $3a + 5b + 2c$ ,  $2a + 3b - c$  and  $a + b + c$
- (iii)  $4x^2 + 8xy - 2y^2$  and  $8xy - 5y^2 + x^2$
- (iv)  $9x^2 - 6x + 7$ ,  $5 - 4x$  and  $6 - 3x^2$
- (v)  $5x^2 - 2xy + 3y^2$ ,  $-2x^2 + 5xy + 9y^2$  and  $3x^2 - xy - 4y^2$

**6. Find the sum of:**

- (i)  $x$  and  $3y$
- (ii)  $-2a$  and  $+5$
- (iii)  $-4x^2$  and  $+7x$
- (iv)  $+4a$  and  $-7b$
- (v)  $x^3$ ,  $3x^2y$  and  $2y^2$
- (vi)  $11$  and  $-by$

**7. Subtract the second expression from the first:**

- (i)  $2a + b$ ,  $a + b$
- (ii)  $-2b + 2c$ ,  $b + 3c$
- (iii)  $5a + b$ ,  $-6b + 2a$
- (iv)  $a^3 - 1 + a$ ,  $3a - 2a^2$
- (v)  $p + 2$ ,  $1$

**8. Subtract:**

- (i)  $4x$  from  $8 - x$
- (ii)  $-8c$  from  $c + 3d$
- (iii)  $-5a - 2b$  from  $b + 6c$
- (iv)  $4p + p^2$  from  $3p^2 - 8p$
- (v)  $5a - 3b + 2c$  from  $4a - b - 2c$

**9. Fill in the blanks:**

- (i)  $5 + 4 = \dots\dots$  and  $5x + 4x = \dots\dots$   
(ii)  $12 + 18 = \dots\dots$  and  $12x^2y + 18x^2y = \dots\dots$   
(iii)  $7 + 16 = \dots\dots$  and  $7a + 16b = \dots\dots$   
(iv)  $1 + 3 = \dots\dots$  and  $x^2y + 3xy^2 = \dots\dots$   
(v)  $7 - 4 = \dots\dots$  and  $7ab - 4ab = \dots\dots$

**10. Fill in the blanks:**

- (i) The sum of  $-2$  and  $-5 = \dots\dots$  and the sum of  $-2x$  and  $-5x = \dots\dots$   
(ii) The sum of  $8$  and  $-3 = \dots\dots$  and the sum of  $8ab$  and  $-3ab = \dots\dots$   
(iii) The sum of  $-15$  and  $-4 = \dots\dots$  and the sum of  $-15x$  and  $-4y = \dots\dots$   
(iv)  $15 + 8 + 3 = \dots\dots$  and  $15x + 8y + 3x = \dots\dots$   
(v)  $12 - 9 + 15 = \dots\dots$  and  $12ab - 9ab + 15ba = \dots\dots$

**11. Add:**

- (i)  $8xy$  and  $3xy$   
(ii)  $2xyz$ ,  $xyz$  and  $6xyz$   
(iii)  $2a$ ,  $3a$  and  $4b$   
(iv)  $3x$  and  $2y$   
(v)  $5m$ ,  $3n$  and  $4p$

**12. Evaluate:**

- (i)  $6a - a - 5a - 2a$   
(ii)  $2b - 3b - b + 4b$   
(iii)  $3x - 2x - 4x + 7x$   
(iv)  $5ab + 2ab - 6ab + ab$   
(v)  $8x - 5y - 3x + 10y$

**13. Evaluate:**

- (i)  $-7x + 9x + 2x - 2x$   
(ii)  $5ab - 2ab - 8ab + 6ab$   
(iii)  $-8a - 3a + 12a + 13a - 6a$

(iv)  $19abc - 11abc - 12abc + 14abc$

14. Subtract the first term from the second:

(i)  $4ab, 6ba$

(ii)  $4.8b, 6.8b$

(iii)  $3.5abc, 10.5abc$

(iv)  $3(1/2)mn, 8(1/2)nm$

15. Fill in the blanks:

(i)  $6 \times 3 = \dots\dots\dots$  and  $6x \times 3x = \dots\dots\dots$

(ii)  $6 \times 3 = \dots\dots\dots$  and  $6x^2 \times 3x^3 = \dots\dots\dots$

(iii)  $5 \times 4 = \dots\dots\dots$  and  $5x \times 4y = \dots\dots\dots$

(iv)  $4 \times 7 = \dots\dots\dots$  and  $4ax \times 7x = \dots\dots\dots$

(v)  $6 \times 2 = \dots\dots\dots$  and  $6xy \times 2xy = \dots\dots\dots$

16. Fill in the blanks:

(i)  $4x \times 6x \times 2 = \dots\dots\dots$

(ii)  $3ab \times 6ax = \dots\dots\dots$

(iii)  $x \times 2x^2 \times 3x^3 = \dots\dots\dots$

(iv)  $5 \times 5a^3 = \dots\dots\dots$

(v)  $6 \times 6x^2 \times 6x^2y^2 = \dots\dots\dots$

17. Find the value of:

(i)  $3x^3 \times 5x^4$

(ii)  $5a^2 \times 7a^7$

(iii)  $3abc \times 6ac^3$

(iv)  $a^2b^2 \times 5a^3b^4$

(v)  $2x^2y^3 \times 5x^3y^4$

18. Multiply:

(i)  $a + b$  by  $ab$

(ii)  $3ab - 4b$  by  $3ab$

(iii)  $2xy - 5by$  by  $4bx$

(iv)  $4x + 2y$  by  $3xy$

(v)  $1 + 4x$  by  $x$

**19. Multiply:**

(i)  $-x + y - z$  and  $-2x$

(ii)  $xy - yz$  and  $x^2yz^2$

(iii)  $2xyz + 3xy$  and  $-2y^2z$

(iv)  $-3xy^2 + 4x^2y$  and  $-xy$

(v)  $4xy$  and  $-x^2y - 3x^2y^2$

**20. Multiply:**

(i)  $3a + 4b - 5c$  and  $3a$

(ii)  $-5xy$  and  $-xy^2 - 6x^2y$

**21. Multiply:**

(i)  $x + 2$  and  $x + 10$

(ii)  $x + 5$  and  $x - 3$

(iii)  $x - 5$  and  $x + 3$

(iv)  $x - 5$  and  $x - 3$

(v)  $2x + y$  and  $x + 3y$

**22. Multiply:**

(i)  $3abc$  and  $-5a^2b^2c$

(ii)  $x - y + z$  and  $-2x$

(iii)  $2x - 3y - 5z$  and  $-2y$

(iv)  $-8xyz + 10x^2yz^3$  and  $xyz$

(v)  $xyz$  and  $-13xy^2z + 15x^2yz - 6xyz^2$

**23. Find the product of:**

(i)  $xy - ab$  and  $xy + ab$

(ii)  $2abc - 3xy$  and  $2abc + 3xy$

(iii)  $a + b - c$  and  $2a - 3b$

(iv)  $5x - 6y - 7z$  and  $2x + 3y$

(v)  $5x - 6y - 7z$  and  $2x + 3y + z$

**24. Divide:**

(i)  $3a$  by  $a$

(ii)  $15x$  by  $3x$

(iii)  $16m$  by  $4$

(iv)  $20x^2$  by  $5x$

(v)  $30p^2$  by  $10p^2$

**25. Simplify:**

(i)  $2x^5 \div x^2$

(ii)  $6a^8 \div 3a^3$

(iii)  $20xy \div -5xy$

(iv)  $-24a^2b^2c^2 \div 6ab$

(v)  $-5x^2y \div xy^2$

**26. Divide:**

(i)  $(-3m / 4)$  by  $2m$

(ii)  $-15p^6q^8$  by  $-5p^6q^7$

(iii)  $-21m^5n^7$  by  $14m^2n^2$

(iv)  $36a^4x^5y^6$  by  $4x^2a^3y^2$

(v)  $20x^3a^6$  by  $5xy$

**27. Simplify:**

(i)  $(-15m^5n^2) / (-3m^5)$

(ii)  $35x^4y^2 / -15x^2y^2$

(iii)  $(-24x^6y^2) / (6x^6y)$

**28. Divide:**

(i)  $9x^3 - 6x^2$  by  $3x$

(ii)  $6m^2 - 16m^3 + 10m^4$  by  $-2m$

(iii)  $15x^3y^2 + 25x^2y^3 - 36x^4y^4$  by  $5x^2y^2$

(iv)  $36a^3x^5 - 24a^4x^4 + 18a^5x^3$  by  $-6a^3x^3$

**29. Multiply:**

(i)  $3x$ ,  $5x^2y$  and  $2y$

(ii)  $5$ ,  $3a$  and  $2ab^2$

(iii)  $5x + 2y$  and  $3xy$

(iv)  $6a - 5b$  and  $-2a$

(v)  $4a + 5b$  and  $4a - 5b$

30. Simplify:

(i)  $2a^2b^2 + 5ab^2 + 8a^2b^2 - 3ab^2$

(ii)  $4a + 3b - 2a - b$

(iii)  $2xy + 4yz + 5xy + 3yz - 6xy$

(iv)  $ab + 15ab - 11ab - 2ab$

(v)  $6a^2 - 3b^2 + 2a^2 + 5b^2 - 4a^2$

### Moderate Level

31. Find the sum of:

(i)  $3a + 4b + 7c, -5a + 3b - 6c$

and  $4a - 2b - 4c$

(ii)  $2x^2 + xy - y^2, -x^2 + 2xy + 3y^2$

and  $3x^2 - 10xy + 4y^2$

(iii)  $x^2 - x + 1, -5x^2 + 2x - 2$

and  $3x^2 - 3x + 1$

(iv)  $a^2 - ab + bc, 2ab + bc - 2a^2$

and  $-3bc + 3a^2 + ab$

(v)  $4x^2 + 7 - 3x, 4x - x^2 + 8$

and  $-10 + 5x - 2x^2$

32. Add the following expressions:

(i)  $-17x^2 - 2xy + 23y^2, -9y^2 + 15x^2 + 7xy$

and  $13x^2 + 3y^2 - 4xy$

(ii)  $-x^2 - 3xy + 3y^2 + 8, 3x^2 - 5y^2 - 3 + 4xy$

and  $-6xy + 2x^2 - 2 + y^2$

(iii)  $a^3 - 2b^3 + a, b^3 - 2a^3 + b$

and  $-2b + 2b^3 - 5a + 4a^3$

33. Evaluate:

(i)  $3a - (a + 2b)$

(ii)  $(5x - 3y) - (x + y)$

(iii)  $(8a + 15b) - (3b - 7a)$

(iv)  $(8x + 7y) - (4y - 3x)$

(v)  $7 - (4a - 5)$

34. Subtract:

(i)  $5a - 3b + 2c$  from  $a - 4b - 2c$

(ii)  $4x - 6y + 3z$  from  $12x + 7y - 21z$

(iii)  $5 - a - 4b + 4c$  from  $5a - 7b + 2c$

(iv)  $-8x - 12y + 17z$  from  $x - y - z$

(v)  $2ab + cd - ac - 2bd$  from  $ab - 2cd + 2ac + bd$

35.(i) Take  $-ab + bc - ca$  from  $bc - ca + ab$ .

(ii) Take  $5x + 6y - 3z$  from  $3x + 5y - 4z$ .

(iii) Take  $(-3/2)p + q - r$  from  $(1/2)p - (1/3)q - (3/2)r$

(iv) Take  $1 - a + a^2$  from  $a^2 + a + 1$

36. From the sum of  $x + y - 2z$  and  $2x - y + z$  subtract  $x + y + z$ .

37. From the sum of  $3a - 2b + 4c$  and  $3b - 2c$  subtract  $a - b - c$ .

38. Subtract  $x - 2y - z$  from the sum of  $3x - y + z$  and  $x + y - 3z$ .

39. Subtract the sum of  $x + y$  and  $x - z$  from the sum of  $x - 2z$  and  $x + y + z$

40. By how much should  $x + 2y - 3z$  be increased to get  $3x$ ?

42. The sum of two expressions is  $5x^2 - 3y^2$ . If one of them is  $3x^2 + 4xy - y^2$ , find the other.

42. The sum of two expressions is  $3a^2 + 2ab - b^2$ . If one of them is  $2a^2 + 3b^2$ , find the other.

43. Subtract  $-5a^2 - 3a + 1$  from the sum of  $4a^2 + 3 - 8a$  and  $9a - 7$ .

44. By how much does  $8x^3 - 6x^2 + 9x - 10$  exceed  $4x^3 + 2x^2 + 7x - 3$ ?

45. What must be added to  $2a^3 + 5a - a^2 - 6$  to get  $a^2 - a - a^3 + 1$ ?

46. What must be subtracted from  $a^2 + b^2 + 2ab$  to get  $-4ab + 2b^2$ ?

47. Find the excess of  $4m^2 + 4n^2 + 4p^2$  over  $m^2 + 3n^2 - 5p^2$ .

48. The sides of a triangle are  $2x + 3y$ ,  $x + 5y$  and  $7x - 2y$ . Find its perimeter.

49. The two adjacent sides of a rectangle are  $6a + 9b$  and  $8a - 4b$ . Find its perimeter.

50. Copy and complete the following multiplications:



$$(i) \frac{3a + 2b}{x - 3xy}$$

$$(ii) \frac{9x - 5y}{x - 3xy}$$

$$(iii) \frac{3xy - 2x^2 - 6x}{x - 5x^2y}$$

$$(iv) \frac{a + b}{x a + b}$$

$$(v) \frac{ax - b}{x 2ax + 2 b^2}$$

## Higher level

51. Evaluate:

(i)  $(c + 5)(c - 3)$

(ii)  $(3c - 5d)(4c - 6d)$

(iii)  $(\frac{1}{2}a + \frac{1}{2}b)(\frac{1}{2}a - \frac{1}{2}b)$

(iv)  $(a^2 + 2ab + b^2)(a + b)$

(v)  $(3x - 1)(4x^3 - 2x^2 + 6x - 3)$

52. Evaluate:

(i)  $(a + b)(a - b)$ .

(ii)  $(a^2 + b^2)(a + b)(a - b)$ , using the result of (i).

(iii)  $(a^4 + b^4)(a^2 + b^2)(a + b)(a - b)$ , using the result of (ii).

53. Evaluate:

(i)  $(3x - 2y)(4x + 3y)$

(ii)  $(3x - 2y)(4x + 3y)(8x - 5y)$

(iii)  $(a + 5)(3a - 2)(5a + 1)$

(iv)  $(a + 1)(a^2 - a + 1)$  and  $(a - 1)(a^2 + a + 1)$ ; and then:  $(a + 1)(a^2 - a + 1) + (a - 1)(a^2 + a + 1)$

(v)  $(5m - 2n)(5m + 2n)(25m^2 + 4n^2)$

54. Multiply:

(i)  $mn^4$ ,  $m^3n$  and  $5m^2n^3$

(ii)  $2mnpq$ ,  $4mnpq$  and  $5mnpq$

(iii)  $pq - pm$  and  $p^2m$

(iv)  $x^3 - 3y^3$  and  $4x^2y^2$

(v)  $a^3 - 4ab$  and  $2a^2b$

54. Multiply:

(i)  $(2x + 3y)(2x + 3y)$

(ii)  $(2x - 3y)(2x + 3y)$

(iii)  $(2x + 3y)(2x - 3y)$

(iv)  $(2x - 3y)(2x - 3y)$

(v)  $(-2x + 3y)(2x - 3y)$

55. Divide:

(i)  $n^2 - 2n + 1$  by  $n - 1$

(ii)  $m^2 - 2mn + n^2$  by  $m - n$

(iii)  $4a^2 + 4a + 1$  by  $2a + 1$

(iv)  $p^2 + 4p + 4$  by  $p + 2$

(v)  $x^2 + 4xy + 4y^2$  by  $x + 2y$

56. The area of a rectangle is  $6x^2 - 4xy - 10y^2$  square unit and its length is  $2x + 2y$  unit. Find its breadth.

57. The area of a rectangular field is  $25x^2 + 20xy + 3y^2$  square unit. If its length is  $5x + 3y$  unit, find its breadth. Hence, find its perimeter.

58. Divide:

(i)  $2m^3n^5$  by  $-mn$

(ii)  $5x^2 - 3x$  by  $x$

(iii)  $10x^3y - 9xy^2 - 4x^2y^2$  by  $xy$

(iv)  $3y^3 - 9ay^2 - 6ab^2y$  by  $-3y$

(v)  $x^5 - 15x^4 - 10x^2$  by  $-5x^2$

59.  $x/2 + x/4$

60.  $a/10 + 2a/5$

61.  $y/4 + 3y/5$

62.  $x/2 - x/8$

63.  $3y/4 - y/5$

64.  $2p/3 - 3p/5$

65.  $k/2 + k/3 + 2k/5$

66.  $2x/5 + 3x/4 - 3x/5$

67.  $4a/7 - 2a/3 + a/7$

68.  $2b/5 - 7b/15 + 13b/3$

69.  $6k/7 - (8k/9 - k/3)$

70.  $3a/8 + 4a/5 - (a/2 + 2a/5)$

71.  $x + x/2 + x/3$

72.  $y/5 + y - 19y/15$

73.  $x/5 + (x + 1)/2$

XX

