CHAPTER-19

FUNDAMENTAL OPERATIONS

QUESTION BANK

AVERAGE LEVEL

1. Fill in the blanks:

(i) $8x + 5x$ = ...

(ii) $8x - 5x$ = ...

(iii) $6xy^2 + 9xy^2$ = ...

(iv) $6xy^2 - 9xy^2$ = ...

(v) The sum of 8a, 6a and 5b = ...

(vi) The addition of 5, 7xy, 6 and 3xy = ...

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

(viii) $-15x + 13x + 8$ = ...

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

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

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 = …….. and 5x + 4x = ……..

(ii) 12 + 18 = ……. and $12x^2y + 18x^2y$ = ……..

(iii) 7 + 16 = …….. and 7a + 16b = …….

(iv) 1 + 3 = ……. and $x^2y + 3xy^2$ = ……

(v) 7 – 4 = …… and 7ab – 4ab = ……..

10. Fill in the blanks:

(i) The sum of -2 and -5 = …… and the sum of -2x and -5x = …….

(ii) The sum of 8 and -3 = …… and the sum of 8ab and -3ab = ……..

(iii) The sum of -15 and -4 = …… and the sum of -15x and -4y = ……..

(iv) 15 + 8 + 3 = …….. and 15x + 8y + 3x = ……..

(v) 12 – 9 + 15 = …….. and 12ab – 9ab + 15ba = …….

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 × 3 = ... and 6x × 3x = ...

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

(iii) 5 × 4 = ... and 5x × 4y = ...

(iv) 4 × 7 = ... and 4ax × 7x = ...

(v) 6 × 2 = ... and 6xy × 2xy = ...

16. Fill in the blanks:

(i) 4x × 6x × 2 = ...

(ii) 3ab × 6ax = ...

(iii) x × $2x^2$ × $3x^3$ = ...

(iv) 5 × $5a^3$ = ...

(v) 6 × $6x^2$ × $6x^2y^2$ = ...

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 – $3x^2$ y^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 + 10 x^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 ÷ – 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) $\begin{array}{r} 3a+2b \\ \times\ x-3xy \\ \hline \end{array}$ (ii) $\begin{array}{r} 9x-5y \\ \times\ x-3xy \\ \hline \end{array}$ (iii) $\begin{array}{r} 3xy-2x^2-6x \\ \times\ x-5x^2y \\ \hline \end{array}$

(iv) $\begin{array}{r} a+b \\ \times\ a+b \\ \hline \end{array}$ (v) $\begin{array}{r} ax-b \\ \times\ 2ax+2b^2 \\ \hline \end{array}$

Higher level

51. Evaluate:

(i) (c + 5) (c – 3)

(ii) (3c – 5d) (4c – 6d)

(iii) (1/2a + 1/2b) (1/2a – 1/2b)

(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 5$m^2$$n^3$

(ii) 2mnpq, 4mnpq and 5mnpq

(iii) pq – pm and p^2m

(iv) x^3 – $3y^3$ and 4$x^2$$y^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. $x/5 + (x + 1)/2$

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