3. NUMBER SERIES

Prime numbers: Numbers which are divisible by only 1 and itself are called Prime numbers.

Prime numbers in first 100 Natural numbers:
2, 3, 5, 7,
11, 13, 17, 19,
23, 29, 31, 37,
41, 43, 47,
53, 59,
61, 67,
71, 73, 79,
83, 89,
97

- ***There are 25 prime numbers in first 100 natural numbers.***

***Composite numbers*:** Numbers which are divisible by more than two numbers.

- ***There are 74 composite numbers in first 100 natural numbers.***

Eg: 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20,…….

The problems from this topic can be classified into 2 types:

Type I

1. Difference series
2. Product series
3. Squares/Cubes series
4. Combination series/alternate series
5. Miscellaneous series

Type II

In these types of questions, a series of numbers are given. These numbers need not follow any specific pattern. The objective is to find out how many times a given condition is satisfied in the given series of numbers.

1. In the following number sequence how many 9's are there that are immediately preceded by 6 and immediately followed by 5?
   1 4 2 6 5 4 3 6 9 5 7 8 6 9 5 3 8 7 4 6 8 2 1 7 6 9 5 8 6 9 5 7 8 4 5

Sol. In the given number sequence
1 4 2 6 5 4 3 6 9 5 7 8 6 9 5 3 8 7 4 6 8 2 1
(1) (2)
7 6 9 5 8 6 9 5 7 8 4 5
(3) (4)

There are four such 4's which are immediately preceded by 6 and immediately followed by 5.

2. In the following number sequence how many odd numbers are there that are immediately preceded by an odd number and immediately followed by an even number?
   3 8 6 5 2 4 3 1 8 7 9 4 6 8 3 1 4 2 7 5 6 4 8 1 3 8 9 7 2 6 4 8 3 6 5 1

Sol. In the given number sequence,
3 8 6 5 2 4 3 1 8 7 9 4 2 6 8 3 1 4 2 7 5 6 4 8 1 3 8 9 7 2 6 4 8 3 5 1

There are 7 odd numbers which are immediately preceded by an odd number and immediately followed by an even number.

Practice Exercise - 1

1. 23, 29, 31, 37, 41, _____
   (1) 47 (2) 43 (3) 40 (4) 42

2. 196, 169,144, _____, 100, 81
   (1) 121 (2) 124 (3) 136 (4) 125

3. 12, 11, 15, 16, 18, 20, _____
   (1) 22 (2) 25 (3) 21 (4) 23

4. 27, 64, 125, 216, 343, _____
   (1) 424 (2) 397 (3) 512 (4) 384

5. 46, 54, 66, 82, 102, _____
   (1) 126 (2) 130 (3) 154 (4) 144

6. 156, 193, 224, _____, 276, 295, 312
   (1) 247 (2) 253 (3) 261 (4) 268

7. 7, 11, 20, 36, 61, 97, _____
   (1) 125 (2) 1361 (3) 121 (4) 146

8. 75, 291, 416, 480, 507, ____
   (1) 515 (2) 532 (3) 511 (4) 521

9. 8, 16, 48, 96, 288, 576, _____
   (1) 1352 (2) 2880 (3) 1428 (4) 1728

10. 16, 8, 8, 12, 24, 60, _____
    (1) 90 (2) 150 (3) 180 (4) 100

11. 12, 21, 39, 75, 147, _____
    (1) 263 (2) 291 (3) 283 (4) 263

12. 5, 13, 41, 85, 257, 517, _____
    (1) 1273 (2) 1516 (3) 1553 (4) 1037

13. 2, 4, 7, 35, 42, 462, _____
    (1) 501 (2) 473 (3) 4712 (4) 475

14. 132, 182, 306, 380, 552, 870, _____
(1) 931 (2) 1010 (3) 992 (4) 1142

15. 2, 10, 30, 68, 130, _____
(1) 216 (2) 222 (3) 240 (4) 210

16. 6, 24, 60, 120, 210, _____
(1) 432 (2) 343 (3) 368 (4) 336

17. 29, 29, 27, 23, 25, 19, 23, 17, ____, _____, _____
(1) 19, 13,19 (2) 19, 15,19
(3) 21, 13,19 (4) 19, 13,21

18. 529, 24, 625, 26, 729, 28, 841, _____
(1) 30 (2) 29 (3) 900 (4) 961

19. 200, 3000, 500000, _____
(1) 600000 (2) 700000
(3) 60000 (4) 70000000

20. 11, 28, 327, 464, _____
(1) 525 (2) 5625 (3) 5125 (4) 5250

21. 1, 4, 9, 61, 52, 63, _____
(1) 49 (2) 94 (3) 75 (4) 70

22. 9, 19, 40, ___, 146
(1) 58 (2) 72 (3) 69 (4) 85

23. 2, 6, 9, 12, 16, 18, _____
(1) 23 (2) 24 (3) 32 (4) 28

24. 3, 10, 29, 66, 127, _____
(1) 187 (2) 164 (3) 216
(4) none of these

25. 15, 52, 26, 63, 37, _____
(1) 70 (2) 20 (3) 74 (4) 55

26. 7, 15, 32, _____ , 138, 281
(1) 85 (2) 64 (3) 67 (4) 104

Directions for questions 27 to 31: In each of the following questions, two rows of numbers are given. The resultant number of each row is to be worked out separately based on the following rules and the question below the row of numbers is to be answered. The operations of numbers progress from left to right.

Rules:
(i) If an odd number is followed by a composite odd number, they are to be multiplied.
(ii) If an even number is followed by an odd number, they are to be added.
(iii) If an even number is followed by a number, which is a perfect square, the even number is to be subtracted from the perfect square.
(iv) If an odd number is followed by a prime number, the first number is to be divided by the second number.
(v) If an odd number is followed by an even number, the second one is to be subtracted from the first one.

27. 16 256 23
12 A 192
If A is the resultant of the first row, what is the resultant of the second row?
(1) 83 (2)91 (3)63 (4)105

28. 65 5 9
109 24 5
What is the sum of the resultants of the two rows?
(1) 117 (2)134 (3) 17 (4) 100

29. 79 64 21
X 7 28
If X is the resultant of the first row and Y is the resultant of the second row, then X+Y =?
(1) 332 (2) 323 (3) 315 (4) 248

30. 143 11 8
12 36 7
Find the difference of the resultants of two rows?
(1) 34 (2) 42 (3) 32
(4) None of these

31. 64 55 17
81 32 2a
If a is the resultant of the first row, what is the resultant of the second row?
(1) 9 (2) 7 (3) 56 (4) 35

Directions for questions 32 to 36: In each of the following questions, two rows of numbers are given. The resultant number of each row is to be worked out separately based on the following rules and the question below the rows of numbers is to be answered. The operation of numbers progress from left to right.

Rules:
(i) If an even number is followed by a composite odd number, then the first number is to be subtracted from the second number.
(ii) If an odd number is followed by a prime number, then the numbers are to be added.
(iii) If an odd number is followed by an even number, then the numbers are to be added.
(iv) If an even number is followed by a prime number then the even number is to be divided by the prime number.
(v) If an even number is followed by an even number, then the first number is to be subtracted from the second number.
(vi) If an odd number is followed by a composite odd number, then the numbers are to be multiplied.

32. 13 12 13
17 19 X
If X is the resultant of the first row, what is the resultant of the second row?
(1) 2 (2)100 (3)85 (4) 74

33. 42 7 76
16 N 3
If N is the resultant of the first row, what is the resultant of the second row?
(1) 10 (2)12 (3)20
(4) None of these

34. 7 6 15
A 5 205
If A is the resultant of the first row, what is the resultant of the second row?
(1) 156 (2) 25 (3) 200
(4) none of these

35. 7 9 2
3 2 15
What is the sum of the resultants of the two rows?
(1) 130 (2) 75 (3)20 (4)140

36. 78 13 33
33 13 57
Find the difference of the resultants of two rows.
(1)14 (2)16 (3)17 (4)18

Directions for questions 37 to 40: Select the correct alternative from the given choices.

37. In the following sequence of digits, how many digits are either immediately preceded by a multiple of 3 or immediately followed by a multiple of 3?
4 3 1 9 3 3 2 3 5 7 3 6 9 3 2 5
(1) 7 (2) 13 (3) 10 (4) 11

38. In the following sequence of digits, how many digits are immediately preceded by a digit which is a multiple of 3 and immediately followed by a digit which is a multiple of 4?
7 3 2 4 6 8 9 3 5 7 8 4 3 2 1 5 6 3 8
(1) 5 (2) 2 (3) 4 (4) 6 (5) 3

39. In the following sequence of digits, how many digits, which are multiples of three, are either immediately followed by an odd digit or immediately proceeded by an even digit?
6 5 7 9 1 1 3 2 3 5 7 8 7 6 2 8
(1) 2 (2) 4 (3) 5 (4) 1 (5) 3

40. In the following sequence of digits, how many odd digits are immediately preceded by and immediately followed by even digits?
2 9 6 8 1 3 4 8 7 6 5 2 1 3 4 3 6 8
(1) 4 (2) 3 (3) 5 (4) 6 (5) 2

***Directions for questions 41 to 48*:** Find the odd one among the following.

41. (1) 17 (2) 27 (3) 37 (4)47 (5) 67
42. (1) 441 (2) 289 (3)361 (4)343 (5) 625
43. (1) 35 (2) 48 (3) 75 (4)84 (5) 57
44. (1) 123 (2) 132 (3) 231 (4)321 (5) 213
45. (1) 36 (2) 49 (3) 64 (4)81 (5) 100
46. (1) 16 (2) 28 (3) 36 (4)64 (5) 4
47. (1) 27 (2) 125 (3) 343 (4)729 (5) 1331
48. (1) 42 (2) 28 (3) 35 (4)84 (5) 64

49. If 5 + 3 + 2 = 151012, 9 + 2 + 4 = 183662
8 + 6 + 3 = 482466, 5 + 4 + 5 = 202504, then
7 + 2 + 5 = ?

50. If 2+3+4 = 21, 2+4+5 = 29
3+2+1 = 32, 4+5+2 = 91, then
5+2+3 =?

Practice Exercise - 2

1. 23, 29, 35, 41, 47, ___
(1) 51 (2) 53 (3) 55 (4) 52

2. 43, 45, 48, 52, 57, ___
(1) 62 (2) 61 (3) 63 (4) 64

3. 71, 63, 56, 50, 55, ___
(1) 54 (2) 53 (3) 49 (4) 51

4. 113, 115, 118, 123, 130, ___
(1) 137 (2) 138 (3) 139 (4) 141

5. 22, 23, 27, 36, 52, ___
(1) 77 (2) 68 (3) 73 (4) 61

6. 15, 16, 24, 51, 115, ____
(1) 240 (2) 184 (3) 200 (4) 196

7. 41, 42, 40, 43, 39, 44, ___
(1) 38 (2) 50 (3) 49 (4) 51

8. 3, 6, 12, 24, 48, ____
(1) 86 (2) 96 (3) 84 (4) 94

9. 4, 8, 24, 96, 480, ____
(1) 1234 (2) 2320 (3) 2880 (4) 2564

10. 15, 60, 180, 360, ____
(1) 720 (2) 360 (3) 540 (4) 620

11. 5, 10, 30, 150, 1050, ___
(1) 9450 (2) 1155 (3) 10605 (4) 11550

12. 2, 4, 6, 8, 18, 16, ___
(1) 32 (2) 24 (3) 54 (4) 20

13. 2, 4, 16, 96, 768, ___
(1) 5672 (2) 7680 (3) 7464 (4) 5684

14. 64, 81, 100, 121, 144, _____
(1) 156 (2) 189 (3) 169 (4) 161

15. 4, 9, 25, 49, _____
(1) 81 (2) 121 (3) 96 (4) 112

16. 2, 4, 5, 8, 8, 12, 11, _____
(1) 14 (2) 16 (3) 15 (4) 10

17. 80, 10, 70, 15, 60, ___
(1) 20 (2) 50 (3) 30 (4) 10

18. 3, 4, 7, 8, 11, 12, ___
(1) 15 (2) 13 (3) 14 (4) 16

19. 8, 43, 11, 41, __, 39, 17
(1) 15 (2) 13 (3) 14 (4) 37

20. 3, 6, 7, 12, 11, 24, 15, _____
(1) 19 (2) 48 (3) 14 (4) 96

21. 64, 125, 216, 343, _____
(1) 684 (2) 564 (3) 512 (4) 492

22. 8, 27, 125, 343, _____
(1) 729 (2) 1000 (3) 881 (4) 1331

23. 30, 68, 130, 222, ___
(1) 350 (2) 336 (3) 343 (4) 333

24. 2, 9, 28, 65, ___
(1) 124 (2) 98 (3) 126 (4) 83

25. 5, 11, 13, 17, ___, 23, 29
(1) 21 (2) 22 (3) 19 (4) 20

26. 9, 8, 14, 39, 152, ___
(1) 760 (2) 694 (3) 755 (4) 445

27. 12, 14, 28, 30, 60, 62, ___
(1) 124 (2) 64 (3) 136 (4) 88

28. 120, 60, 40, 30, 24, ___
(1) 22 (2) 18 (3) 21 (4) 20

29. 16, 36, 100, 324, ___
(1) 1296 (2) 1156 (3) 961 (4) 1024

30. 8, 10, 16, 54, 208, ___
(1) 1370 (2) 1340 (3) 1050 (4) 1210

Number series:Exercise-1																		
1	2	**6**	2	**11**	2	**16**	4	**21**	2	**26**	3	**31**	4	**36**	2	**41**	2	**46**	2
2	1	**7**	4	**12**	3	**17**	3	**22**	3	**27**	1	**32**	1	**37**	2	**42**	4	**47**	4
3	3	**8**	1	**13**	4	**18**	1	**23**	1	**28**	2	**33**	4	**38**	2	**43**	1	**48**	5
4	3	**9**	4	**14**	3	**19**	4	**24**	4	**29**	1	**34**	4	**39**	5	**44**	2	**49**	143542
5	1	**10**	3	**15**	2	**20**	3	**25**	3	**30**	4	**35**	4	**40**	1	**45**	2	**50**	132

Number series:Exercise-2											
1	2	**6**	1	**11**	4	**16**	2	**21**	3	**26**	3
2	3	**7**	1	**12**	3	**17**	1	**22**	4	**27**	1
3	4	**8**	2	**13**	2	**18**	1	**23**	1	**28**	4
4	4	**9**	3	**14**	3	**19**	3	**24**	3	**29**	2
5	1	**10**	2	**15**	2	**20**	2	**25**	1	**30**	3