SEQUENCE AND SERIES

INTRODUCTION

Sequences and series consists of questions where you are supposed to understand the logic behind a given sequence or series of number/ alphabets.
Based on this understanding you are supposed to determine either:
(a) A continuation to the series
(b) The immediate next term of the series or
(c) A missing term/ terms within the series.

While preparing yourself to solve such questions, you should improve your ability to spot a relationship between terms within the series. The common logical premises used for questions are given here.

KEY POINTS

Series Based on Numbers
1. Squares
2. Squares + something or squares– something e.g. next term in the series 24, 35, 48, 63, 80... will be 99 since the series is (52 + 1), (62 + 1), etc.
3. Cubes, cubes + something, cubes– something
4. Geometric series
5. Arithmetic series
6. Harmonic series
7. Series of constantly changing additions or multiplications, e.g.,
(i) 2, 6, 24, 120,..... (The terms are got by ¥ 3, ¥ 4, ¥ 5, and so on.)
(ii) 11, 16, 22, 29, 37,..... (The series follows a logic of + 5, + 6, + 7, + 8, and so on.)
8. Binary numbers systems or number systems with other bases like Base 3, Base 4, etc.
9. Intermingled series–
e.g., 2, 5, 6, 10, 18, 15, 54 In this series alternate terms starting with the first form a GP with common ratio 3, while the 2nd, 4th, 6th terms form an AP 5, 10, 15.....

Series Based on Alphabets

In such series, the most crucial aspect is to know the position of each alphabet in the alphabet series A to Z both from start to end. Thus, the following reference numbers for each alphabet become important:

Going Forward	Alphabet	Going back from Z
1	A	26
2	B	25
3	C	24
4	D	23
5	E	22
6	F	21
7	G	20
8	H	19
9	I	18
10	J	17
11	K	16
12	L	15
13	**M**	**14**
14	**N**	**13**
15	O	12
16	P	11
17	Q	10
18	R	9
19	S	8
20	T	7
21	U	6
22	V	5
23	W	4
24	X	3
25	Y	2
26	Z	1

Notice that M and N are the two middle points of this series.

EXAMPLE PROBLEM

Illustration 1:
Which of the numbers given below would come next in the series of numbers? 1, 9, 25, __
(a) 36
(b) 25
(c) 49
(d) none of these
Solution:
The first number is 1, second is 9 and third is 25. We can easily observe that the numbers in the series are squares of consecutive odd numbers. Hence, the next number would be the square of 7 which would be 49.
Thus Option (c) is correct.

Illustration 2:
Which of the following letters would come next in the series of letters? Z, W, R, K, __
(a) A
(b) C
(c) B
(d) D
Solution:
In the given series from the end of the alphabet series, Z is the 1st alphabet, W is the 4th alphabet, R is the 9th alphabet and K is the 16th alphabet.
Thus the next letter in the series will be the 25th alphabet from the end or the second from the start. Hence, the next alphabet must be B.
Thus (c) is the correct option.

Illustration 3:
What would come next in the following series of numbers? 1, 2, 10, 37, __
(a) 62
(b) 91
(c) 101
(d) none of these
Solution:
The series is following the + 1, + 8, + 27 routine. Hence, the next number must be at an interval of + 64 and should be 101.
Thus Option (c) is the correct answer.

PRACTICE PROBLEMS (EXPLANATORY ANSWERS AT THE END)

1. Find out the missing term: 1. 0, 3, 8, 15, 24, 35, 48?
(a) 53
(b) 63
(c) 80
(d) none of these

2. 256, 64, 16, 4, ?
(a) 1
(b) 1/ 4
(c) 1/ 16
(d) none of these

3. Obtain the missing term B, G, K, ?
(a) N
(b) P
(c) M
(d) L

4. 7,15, 27, ?, 63
(a) 42
(b) 43
(c) 38
(d) none of these

5. ?, 425, 600, 825, 1100, 1425
(a) 225
(b) 300
(c) 250
(d) none of these

6. 1, 121, 12321, 1234321, ___?
(a) 123454321
(b) 12344321
(c) 12345654321
(d) none of these

7. 0.005, 0.05, ?, 5
(a) 5.50
(b) 0.05
(c) 0.5
(d) none of these

8. 31, 32, 36, 45, ?
(a) 55
(b) 56
(c) 61
(d) 62

9. 1, 5, 2, 25, 3, 125, 4, ?
(a) 144
(b) 36
(c) 625
(d) 500

10. 83, 82, 80, 77, ?
(a) 74
(b) 73
(c) 75
(d) 76

11. 2/ ÷ 3–, 3/ ÷ 4–, 4/ ÷ 5–, ?
(a) 5/ ÷ 6–
(b) 5/ ÷ 5–
(c) 6/ ÷ 5–
(d) none of these

12. 1, 1, 5, 49, 11, 169, 19, ?
(a) 256
(b) 289
(c) 324
(d) 361

13. 5, 36, 253, ?
(a) 1749
(b) 1750
(c) 1772
(d) 1771

14. 45678912, 5678912, 567891, ?
(a) 56789
(b) 67891
(c) 567891
(d) none of these

15. ABCDEFG, GABCDEF, FGABCDE, ?
(a) EFGABCD
(b) GABCDEF
(c) EFGABCDE
(d) FGABCDE

SOLUTION WITH EXPLNATORY ANSWER

1. The series is following the pattern + 3, + 5, + 7, + 9, + 11, + 13 and hence the next term should be 48 + 15 = 63. Answer is option (b).

2. The given series is a GP with common ratio 1/4 . Hence, option (a) is correct.
3. The series is defined by the 2nd, 7th, 11th term of the alphabet. Hence, the next term would be the 14th term i.e., N. Option (a) is the correct answer.
4. The series follows a pattern of + 8, + 12, +__, + 20. Obviously we need to add 16 for the missing term. Hence, 43 i.e., option (b) is the correct answer.
5. The series follows a pattern of + 175, + 225, + 275, + 325. Hence, the first term should be 300, so the answer is option (b).
6. The series is representing the values of 12, 112, 1112, 11112. Hence, the next value would be 111112 = 123454321, so option (a) is the answer.
7. A GP with common ratio 10. Hence, the missing term will be 0.5 i.e., option (c).
8. + 1, + 4, + 9, thus + 16 and hence the next term should be 61. Correct answer is option (c).
9. There are two series intermixed with one another. One of the series is placed at the odd places of the series and the other is placed at the even places. The series at the even places of the series is 5, 25, 125 and hence its next term should be 625. Option (c) is correct answer.
10. The logic of the series is –1, –2, –3 and hence –4 should give us 73. So, the answer is option (b).
11. Obviously the answer has to be option (a).
12. There are two series intermingled in the given series of numbers. 1, 5, 11, 19 and the other series is 12, 72, 132 and 192 = 361. Hence, option (d) is the answer.
13. The series follows the pattern of ¥ 7 + 1. Hence, the next number in the series is 253 ¥ 7 + 1 = 1772. Option (c) is the answer.
14. We are consecutively deleting one digit from the left and then one digit from the right and then the next move has to be to delete one digit from the left. Hence, the answer is option (b).
15. The next term is formed by removing the last alphabet in the previous term and attaching it to the first alphabet of the next term. Hence, the next term in the series would be EFGABCD. So, the answer is option (a).