# UNIT-3

## CHAPTER 4
## NUMBER and ALPHABET SERIES
## BASIC CONCEPT BUILDER

Number series tests present numerical sequences that follow a logical rule which is based on elementary arithmetic. An initial sequence is given from which the rule is to be deduced. You are then asked to predict the next number that obeys the rule. The difficulty level of these questions can increase in two ways; first, the logic behind the sequence becomes less trivial and demands attention and creativity; second, the missing number can be positioned at an early stage, thus preventing you from deciphering the hidden rule by looking only at the previous numbers in the sequence.

**How to Solve Number Series?**

See some general solving tips for number series test. In JobTestPrep's preparation package you will find all tips for solving number series tests.

1. Examine the difference between adjacent numbers.
→ In a simple series, the difference between two consecutive numbers is constant.

**Example: 27, 24, 21, 18, __**

**Rule:** There is a difference of (-3) between each item. The missing number in this case is **15**.
→ In a more complex series the differences between numbers may be dynamic rather than fixed, but there still is a clear logical rule.

**Example: 3, 4, 6, 9, 13, 18, __**

**Rule:** Add 1 to the difference between two adjacent items. After the first number add 1, after the second number add 2 and after the third number add 3, etc. In this case, the missing number is **24**.

2. See whether there is a multiplication or division pattern between two adjacent numbers.

**Example: 64, 32, 16, 8, __**

**Rule:** Divide each number by 2 to get the next number in the series.The missing number is **4**.
3. Check whether adjacent numbers in the series change based on a logical pattern.

**Example: 2, 4, 12, 48, __**

**Rule:** Multiply the first number by 2, the second number by 3 and the third number by 4, etc.The missing item is **240**.

4. See if you can find a rule that involves using two or more basic arithmetic functions (+, -, ÷, x). In the below series, the functions alternate in an orderly fashion.

**Example: 5, 7, 14, 16, 32, 34, __**

**Rule:** Add 2, multiply by 2, add 2, multiply by 2, etc. The missing item is **68**.

**Tip:** Series' in this category are easy to identify. Just look at the numbers that do not appear to have a set pattern.

**Important:**

In a series that involves two or more basic arithmetic functions, the differences between adjacent items effectively create their own series. We recommend that you try to identify each pattern separately.

**Example: 4, 6, 2, 8, 3, __**

**Rule:** In this series, the differences themselves create a series: +2, ÷3, x4, -5

The numbers advance by intervals of 1 and the arithmetic functions change in an orderly sequence. The next arithmetic function in the series should be +6, and so the next item in the series is **9** (3+6 = 9).

## LETTER SERIES

**Type – 1:**

- A series of single, pairs of groups or combination of letters and numerals is given.
- The terms of the series form a certain pattern as regards the position of the letters in the English alphabet.
- You have to decipher the pattern and accordingly, find the missing term or wrong term in the given series.

**Examples**:

1. A, C, F, J, ?, ?

Sol: A (B) C, C (D, E) F, F (G, H, I) J, J (K, L, M, N) O, O (P, Q, R, S, T) U
So, the next terms are O, U.

2. AC, FH, KM, PR, ?

Sol: See all the first letters of the given series.
A (B, C, D, E) F, F (G, H, I, J) K, K (L, M, N, O) P (Q, R, S, T) U
Now, see all the second letters of the given series.
C (D, E, F, G) H, H (I, J, K, L) M, M (N, O, P, Q) R (S, T, U, V) W
So, the next term will be UW.

3. BMO, EOQ, HQS, ?

Sol: See all the first letters of the given series.
B (C, D) E, E (F, G) H, H (I, J) K
Now, see all the second letters of the given series.
M (N) O, O (P) Q, Q (R) S
Now, see all the third letters of the given series.
O (P) Q, Q (R) S, S (T) U
So, the next term will be KSU.

4. ?, WFD, UHG, SKI, QOL

Sol: See all the first letters of the given series from last term.
Q (R) S, S (T) U, U (V) W, W (X) Y,
Now, see all the second letters of the given series from first term.
E (-) F, F (G) H, H (I, J) K, K(L, M, N) O
Now, see all the third letters of the given series.
B (C) D, D (E, F) G, G (H) I, I (J, K) L
So, the missing term will be YEB.

**Type – 2:**

**Alpha-Numeric Series:** It is a jumbled combination of Alphabetic and Numeric series.

**Examples:**

1. Z1A, X2D, V6G, T21J, R88M, ?

Sol: The series formed by the numerals 1, 2, 6, 21, 88,… follow the pattern
x 1 + 1, x 2 + 2, x 3 + 3, x 4 + 4, …
So, numeral in the desired term = 88 x 5 + 5 = 445
Observe the first letters of all the terms.
Z (Y) X, X (W) V, V (U) T, T (S) R, R (Q) P
Observe the second letters of all the terms.
A (B, C) D, D (E, F) G, G (H, I) J, J (K, L) M, M (N, O) P
So, the next term in the series will be P445P.

2. Find the odd man out from the following series.

G4T, J10R, M20P, P43N
Sol: Observe the pattern followed by the first letter in all the terms.
G (H, I) J, J (K, L) M, M (N, O) P
Observe the pattern followed by the second letter in all the terms.
T (S) R, R (Q) P, P (O) N
Observe the pattern followed by the numerals in all the terms.
Here, if x 2 + 1 rule is satisfied then second term should be J9R.
This rule can be applied to whole series except the second term.
So, J10R is the odd man.

**Type – 3:**

**Continuous Pattern Series:**

- This type of series usually consists of a small letters which follow a certain pattern.
- But some letters will be missing from the series.
- These missing letters are then given in a proper sequence as one of the choices.
- You have to choose the correct alternative.

**Example:**

1. aab _ aaa _ bba _

1) baa 2) abb 3) bab 4) aab 5) bbb
Sol:
Step 1: Fill the first blank space by ‘b’ so that you can have two a’s followed by two b’s.
Step 2: Fill the second blank space either by ‘a’ so that you have four a’s followed by two b’s or ‘b’ so that you have three a’s followed by three b’s.
Step 3: The last space must be filled by ‘a’.

Step 4: So, now you can have two possible answers: ‘baa’ and ‘bba’. But, only baa appears in the choices. Thus 1 is the answer.
Step 5: In case, you have both the possible answers in the choices, you have to chose the one that forms a more prominent pattern, which is aabb/aaabbb/aa. Thus, your answer should be ‘bba’.

## EXERCISE –SERIES
## CONTENT AS PER IBPS LEVEL

DIRECTIONS (Q. 1 - 12) : What should come in place of question mark (?) in the following number series?
1. 1050 420 168 67.2 26.88 10.752 ?
(a) 4.3008 (b) 6.5038 (c) 4.4015 (d) 5.6002 (e) None of these
2. 0 6 24 60 120 210 ?
(a) 343 (b) 280 (c) 335 (d) 295 (e) None of these
3. 15 19 83 119 631 (?)
(a) 731 (b) 693 (c) 712 (d) 683 (e) None of these
4. 19 26 40 68 124 (?)
(a) 246 (b) 238 (c) 236 (d) 256 (e) None of these
5. 11 10 18 51 200 (?)
(a) 885 (b) 1025 (c) 865 (d) 995 (e) None of these
6. 14 24 43 71 108 (?)
(a) 194 ( b) 154 (c) 145 (d) 155 (e) None of these
7. 144 173 140 169 136 (?)
(a) 157 ( b) 148 (c) 164 (d) 132 (e) None of these
8. 656 352 200 124 86 (?)
(a) 67 (b) 59 (c) 62 (d) 57 (e) None of these
9. 12 18 36 102 360 (?)
(a) 1364 (b) 1386 (c) 1384 (d) 1376 (e) None of these
10. 71 78 99 134 183 (?)
(a) 253 (b) 239 (c) 246 (d) 253 (e) None of these
11. 342 337.5 328.5 315 297 (?)
(a) 265.5 (b) 274.5 (c) 270 (d) 260 (e) None of these
12. 161 164 179 242 497 (?)
(a) 1540 (b) 1480 (c) 1520 (d) 1440 (e) None of these

**DIRECTIONS (Q. 13 - 21) :In each of these questions, a number series is given. In each series, only one number is wrong number.Find out the wrong number.**
13. 3601 3602 1803 604 154 36 12
(a) 3602 (b) 1803 (c) 604 (d) 154 (e) 36
14. 4 12 42 196 1005 6066 42511
(a) 12 (b) 42 (c) 1005 (d) 196 (e) 6066
15. 32 16 24 65 210 945 5197.5
(a) 945 (b) 16 (c) 24 (d) 210 (e) 65
16. 7 12 40 222 1742 17390 208608
(a)7 (b) 12 (c) 40 (d) 1742 (e) 208608
17. 6 91 584 2935 11756 35277 70558
(a) 91 (b) 70558 (c) 584 (d) 2935 (e) 35277
18. 9050 5675 3478 2147 1418 1077 950
(a) 3478 (b) 1418 (c) 5675 (d) 2147 (e) 1077
19. 8424 4212 2106 1051 526.5 263.25 131.625
(a) 131.625 (b) 1051 (c) 4212 (d) 8424 (e) 263.25
20. 850 600 550 500 475 462.5 456.25

(a) 600 (b) 550 (c) 500 (d) 4625 (e) None of these
21. 8 12 24 46 72 108 216
(a) 12 (b) 24 (c) 46 (d) 72 (e) None of these

**DIRECTIONS (Q. 22 - 27) :What should come in place of question mark (?) in the following number series?**
22. 980 484 260 112 50 ? 3.5
(a) 25 (b) 17 (c) 21 (d) 29 (e) None of these
23. 1015 508 255 129 66.5 ? 20.875
(a) 34.50 (b) 35 (c) 35.30 (d) 35.75 (e) None of these
24. 354 180 64 21 10.2 ?
(a) 5.6 (b) 8.7 (c) 3.8 (d) 1.7 (e) None of these
25. 4.5 18 2.25 ? 1.6875 33.75
(a) 27 (b) 25.5 (c) 36 (d) 40 (e) None of these
26. 59.76 58.66 56.46 52.06 ? 25.66
(a) 48.08 (b) 46.53 (c) 43.46 (d) 43.26 (e) None of these
27. 36 157 301 470 ? 891
(a) 646 (b) 695 (c) 639 (d) 669 (e) None of these

**DIRECTIONS (Qs. 28 to 30) :Which one of the letters when sequentially placed at the gaps in the given letter series shall complete it?**
28. a b – b c b c a – – c – b a b
(a) a b c c (b) a c b c (c) b a a a (d) c c a a (e) None of these
29. a b – c b b – a – c c a – ba
(a) c c a b (b) b b c a (c) a c b c (d) a a c b (e) None of these
30. a – c a c b c – b a c a – – b
(a) c a c b (b) b a b c (c) a b a c (d) b a b a (e) None of these