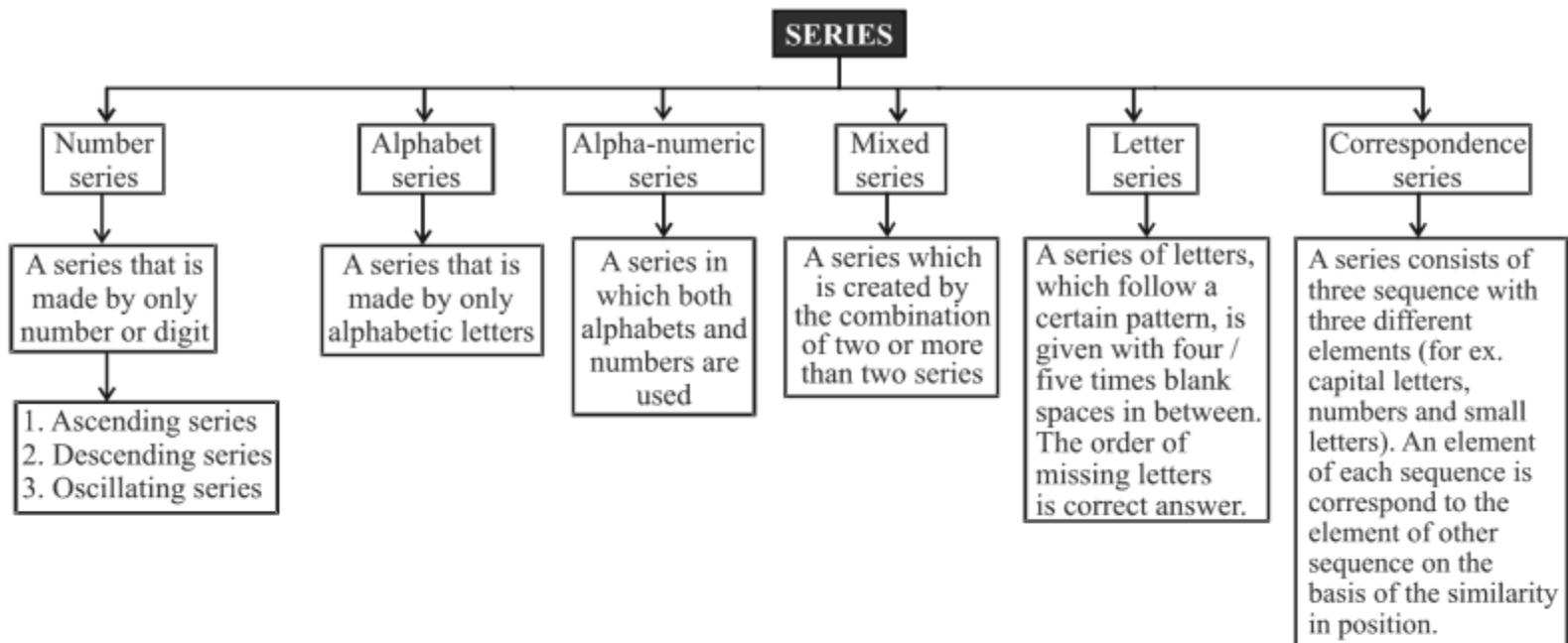


# Series

A series is a sequence of numbers/alphabetical letters or both which follow a particular rule. Each element of series is called 'a term'. We have to analyse the pattern and find the missing term or next term to continue the pattern.

Types of Series are Explained in the following Chart :



## NUMBER SERIES

**Number series** is a form of numbers in a certain sequence, where some numbers are wrongly put into the series of numbers or some number is missing in that series, we need to observe first and then find the accurate number to that series of numbers.

### Different types of Number Series

#### 1. Perfect Square Series

This type of series are based on square of a number which is in same order and one square number is missing in that given series.

**Example** 1. 841, ?, 2401, 3481, 4761

**Sol.**  $29^2, 39^2, 49^2, 59^2, 69^2$

#### 2. Perfect Cube Series

Perfect cube series is an arrangement of numbers is a certain order, where some number which is in same order and one cube is missing in that given series.

**Example** 2. 4096, 4913, 5832, ?, 8000

**Sol.**  $16^3, 17^3, 18^3, 19^3, 20^3$

#### 3. Mixed Number Series

Mixed number series is an arrangement of numbers in a certain order. This type of series has more than one different order which arranged alternatively in single series or created according to any non conventional rule.

E.g 1, 111, 220, 438, ?, 1746.

**Example** 3. 6, ?, 33, 69, 141, 285

**Sol.**  $\times 2 + 3, \times 2 + 3$

**Example** 4. 4, 16, 64, 256, 1024, ?

**Sol.** Multiply each number by 4 to get the next number.

$$4 \times 4 = 16$$

$$16 \times 4 = 64$$

$$64 \times 4 = 256$$

$$256 \times 4 = 1024$$

$$1024 \times 4 = 4096$$

### Types of Questions

- (I) Complete the series
- (II) Find missing number of the series
- (III) Find wrong number of the series

### Examples on Number Series

- (I) Complete the Series

**Example** 5. Which of the following is the next term of series given below ?

4, 6, 9, 13, ....

- (a) 17      (b) 18      (c) 19      (d) 20

Sol. (b)  $4 \xrightarrow{+2} 6 \xrightarrow{+3} 9 \xrightarrow{+4} 13 \xrightarrow{+5} 18$

So, 18 is correct answer.

**(II) To Find the Missing Number of Series**

**Example** 6. What will come in place of question mark in the following series?

79, 87, ?, 89, 83

- (a) 80,      (b) 81      (c) 82      (d) 88

Sol. (b)  $79 \xrightarrow{+8} 87 \xrightarrow{-6} 81 \xrightarrow{+8} 89 \xrightarrow{-6} 83$

So, 81 is correct answer.

**(III) To Find the Wrong Number in the Series**

**Example** 7. Find the wrong number in the series

3, 8, 15, 24, 34, 48, 63.

- (a) 15      (b) 15      (c) 34      (d) 63

Sol. (c)  $2^2 - 1, 3^2 - 1, 4^2 - 1, 5^2 - 1, 6^2 - 1, \dots$

**LETTER SERIES**

What is letter series?

Letter series is a sequence of elements made of letters from English alphabet. Such series follow a certain pattern

**Example** 8. P, R, T, V, X

**Series pattern:** Every next letter in the series takes place two steps forward.

**Types of the letter series:**

(i) **Forward order series:**

**Example** 9. D, G, J, M, P, S, V

**Series pattern:** Every next letter takes place 3 steps forward.

(ii) **Backward order series:**

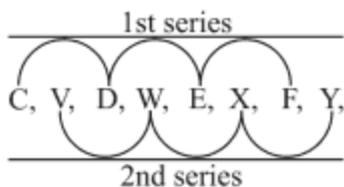
**Example** 10. U, R, O, L, I

**Series pattern:** Every next letter takes place 3 steps backward.

(iii) **Multiple series:**

**Example** 11. C, V, D, W, E, X, F, Y

**Series pattern:**



(iv) **Opposite letter series:**

**Example** 12. AZ, BY, CX, DW, EV

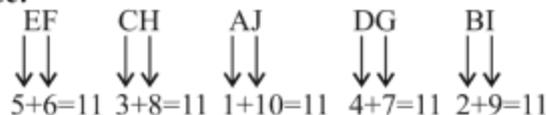
**Series pattern:** Each element of the series is made of two opposite letters.

(v) **Series based on letter position:**

**Example** 13. EF, CH, AJ, DG, BI

**Series pattern:** In each term, the sum of letter positions is equal to 11.

Let us see:



(vi) **Small letter based series:**

**Example** 14. Complete the following series with one of the given options.

ab\_d\_aaba\_na\_badna\_b

- (a) andaa      (b) babda      (c) badna      (d) dbanb

**Series pattern:** ab/adna/ab/adna/ab/adna/ab

Clearly, option (a) is the correct answer.

**MIXED SERIES**

Such series is a sequence of many elements made of numbers and letters arranged from left to right. In some cases some symbols may take place in such series. The symbols may be '+', '-', 'x', '÷', '?', '>', '<', '=' etc. In other words we can say that a mixed series is sequence of diverse elements.

**Types of the mixed series:**

(i) **Forward sequence pattern:**

**Example** 15. E, -3, G, 1, I, 5, K, 9

**Series pattern:** Letters and numbers take place alternately. Every next letter is two letters ahead from the previous letter and every next number increases by 4.

(ii) **Backward sequence pattern:**

**Example** 16. T, 13, R, 12, P, 11, N, 10, L, 9, J, 8

**Series pattern:** Letters and numbers take place alternately. Every next letter is two letters backward from the previous letter and every next number decreases by 1.

(iii) **Mixed Sequence (Forward & backward both) pattern:**

**Example** 17. E, 45, I, 40, M, 35, Q, 30

**Series pattern:** Letters and numbers take place alternately. Every next letter is four letters forward from the previous letter and every next number decreases by 5.

(iv) **Miscellaneous pattern**

**Examples on Alphabetic Series**

**Example** 18. What will come in place of question mark in the following series?

G, H, J, M, ?

- (a) R      (b) S      (c) Q      (d) P

Sol. (c)  $G \xrightarrow{+1} H \xrightarrow{+2} J \xrightarrow{+3} M \xrightarrow{+4} Q$

# EXERCISE

**DIRECTIONS (Qs.1-8):** Which one set of letters when sequentially placed at the gaps in the given letter series shall complete it ?

1. \_ a a \_ b a \_ b b \_ a b \_ a a b  
(a) b a b a b (b) a a a b b (c) b b a a b (d) b b b a a
2. \_ b b m \_ a m b \_ m \_ a \_ b b  
(a) m b a b m (b) a b m a b  
(c) m a b a m (d) a m b b m
3. a b \_ a a \_ a a a \_ a \_ a b \_ a  
(a) a b b a b (b) a b a a a (c) a a b b a (d) a b b a a
4. LU \_ TUPLUBTU \_ LUBT \_ P \_ UBTUP  
(a) PBUL (b) BPUL (c) LBPU (d) BUPL
5. B \_ CCABB \_ CABBC \_ AB \_ CCA  
(a) BCCB (b) BCBC (c) BBCC (d) BBBC
6. \_\_ aba \_\_ ba \_ ab  
(a) bbaba (b) abbbb (c) baabb (d) abbab
7. SH \_ ELAS \_ EELA \_ HEELA SHEE \_ A  
(a) ELHA (b) EHSL (c) EEHS (d) HHSS
8. BR \_\_ NB \_ O \_ NB  
(a) OWOW (b) OWRW (c) RORO (d) WNWN

**DIRECTIONS (Qs. 9-32):** A series is given, with one term missing. Choose the correct alternative from the given ones that will complete the series.

9. DIB, HMF, LQJ, ?  
(a) OTM (b) QVO (c) PVO (d) PUN
10. NOA, PQB, RSC, ?  
(a) TUD (b) DTU (c) ENO (d) FNQ
11. DFI, KMP, ?, YAD  
(a) QSV (b) RTW (c) SUX (d) RTV
12. 313, 623, 933, 1243, ?  
(a) 1863 (b) 2173 (c) 1553 (d) 2483
13. 975, 864, 753, 642, ?  
(a) 431 (b) 314 (c) 531 (d) 532
14. 15, 31, 64, 131, ?  
(a) 266 (b) 256 (c) 192 (d) 524
15.  $\frac{2}{3}, \frac{4}{7}, ?, \frac{11}{21}, \frac{16}{31}$   
(a)  $\frac{6}{11}$  (b)  $\frac{5}{9}$  (c)  $\frac{9}{17}$  (d)  $\frac{7}{13}$
16. 96 94 373 3353 ? 1341069  
(a) 83819 (b) 53483 (c) 63813 (d) 53643

17. 45 43 83 245 975 ?  
(a) 4869 (b) 4846 (c) 4896 (d) 4852
18. 16 16 40 140 ?  
(a) 804 (b) 840 (c) 408 (d) 968
19. IKM, NPR, SUW, ?  
(a) XZB (b) XAZ (c) AZX (d) ZAX
20. UXR, SVP, CFZ, ?  
(a) ADX (b) YBW (c) VXT (d) QUN
21. Z, W, S, P, L, I, E, ?  
(a) B (b) D (c) F (d) K
22. B I O ? X A  
(a) T (b) R (c) V (d) P
23.  $7\frac{1}{7}, 8\frac{2}{6}, 9\frac{5}{5}, 12\frac{2}{4}, 16\frac{2}{3}, \text{---}$   
(a)  $\frac{50}{2}$  (b)  $15\frac{2}{4}$  (c) 35 (d)  $16\frac{4}{4}$
24. 24, 35, 20, 31, 16, 27, \_\_, \_\_  
(a) 9, 9 (b) 8, 25 (c) 12, 23 (d) 5, 30
25. 4, 6, 10, 16, 24, ?  
(a) 40 (b) 34 (c) 30 (d) 28
26. 3, 5, 9, 17, ?  
(a) 65 (b) 33 (c) 42 (d) 26
27. 3, 5, 35, 10, 12, 35, \_\_, \_\_  
(a) 19, 35 (b) 17, 19 (c) 19, 24 (d) 22, 35
28. 36, 34, 30, 28, 24, ?  
(a) 26 (b) 23 (c) 22 (d) 20
29. AZBY, CXDW, EVFU, ?  
(a) SHTG (b) GXHW (c) GTHS (d) STHO
30. 325, 259, 204, 160, 127, 105, ?  
(a) 94 (b) 96 (c) 98 (d) 100
31. CGJ, KOR, TXA, ?  
(a) ACE (b) JDP (c) DHK (d) UWY
32. B - 1, D - 2, F - 4, H - 8, J - 16, ?  
(a) K - 64 (b) L - 32 (c) M - 32 (d) L - 64

**DIRECTIONS (Qs. 33-35):** Find the wrong number.

33. 25, 27, 29, 31, 34, 35  
(a) 27 (b) 29 (c) 34 (d) 35
34. 1236, 2346, 3456, 4566, 5686  
(a) 1236 (b) 3456 (c) 4566 (d) 5686
35. 12439, 23549, 34659, 45769, 57689  
(a) 34659 (b) 23549 (c) 57689 (d) 12439

**DIRECTIONS (Qs. 36-38):** Study the sequence pattern of letters or numbers carefully to work out the pattern on which it is based, and answer what the next item in the sequence must be.

36. ABP, CDQ, EFR, ?  
(a) GHS (b) GHT  
(c) HGS (d) GHR
37. P3C, R5F, T8I, V12L?  
(a) Y17O (b) X16M  
(c) X17O (d) X16O
38. 13, 25, 51, 101, 203, ?  
(a) 405 (b) 106  
(c) 407 (d) 411
39. Examine the following numbers and identify the next number:  
45; 43; 40; 36; 31; 25; ....  
(a) 17 (b) 23  
(c) 29 (d) 18

**DIRECTIONS (Qs. 40-43):** Find the missing numbers/letters in following series.

40. 3, 20, 63, 144, 275, ?  
(a) 468 (b) 461 (c) 467 (d) 469
41. 113, ?, 164, 215, 283, 368  
(a) 132 (b) 130 (c) 129 (d) 128
42. AYBZC, DWEXF, GUHVI, ?, MQNRO  
(a) LSJTL (b) JSKLT  
(c) JSKTL (d) LTSKY
43. Z1A, X2D, V6G, T21J, R88M ?  
(a) P440P (b) N2670S  
(c) N2676S (d) P445P
44. Examine the series and identify the missing number:  
46, 44, 40, 38, 34, ...  
(a) 30 (b) 32  
(c) 28 (d) 26
45. If in a certain code, the word MILITARY is written as 12324567, then in the same code, the word TAIL will be written as:  
(a) 2345 (b) 3254  
(c) 4523 (d) 5432
46. In the series of alphabets given below, which is the missing alphabet series?  
AX, DU, GR, \_\_\_\_\_, ML  
(a) HQ (b) IK  
(c) JO (d) JN

**DIRECTIONS (Qs. 47-48):** Find out the wrong number.

47. 5, 7.5, 11.25, 17.5, 29.75, 50, 91.25  
(a) 29.75 (b) 17.5  
(c) 91.25 (d) 50
48. 10, 13, 26, 37, 51, 77, 106, 133.  
(a) 133 (b) 51 (c) 26 (d) 13

**DIRECTIONS (Qs. 49-50):** Find out the missing number/words.

49. ST39, UV43, WX47, ?  
(a) YZ 47 (b) YZ 52  
(c) YZ 51 (d) YZ 50
50. 13 (168) 13, 14 (181) 13, 15 (?) 13  
(a) 196 (b) 195 (c) 190 (d) 194
51. Find the missing group in the sequence:  
X7D, V11G, T13J, \_\_\_\_\_, P19P  
(a) Q15M (b) R17M  
(c) Q17L (d) R15M
52. Find the missing number in the sequence:  
9, 3, \_\_\_\_\_, 1/3, 1/9  
(a) 2 (b) 6 (c) 1/2 (d) 1
53. Find the next group of alphabets:  
CFI, DHL, ILO, LPT, \_\_\_\_\_?  
(a) ORU (b) RUW  
(c) OQT (d) OSV
54. Look at this series: 7, 10, 8, 11, 9, 12, ...  
What number should come next?  
(a) 7 (b) 10 (c) 12 (d) 13

**DIRECTIONS (Qs. 55-56):** Find out the wrong number in the series.

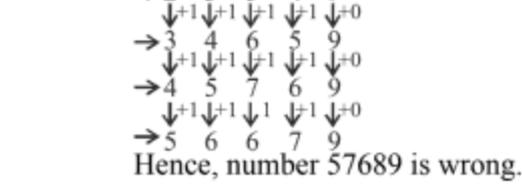
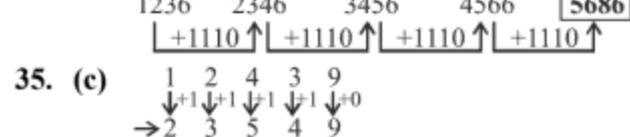
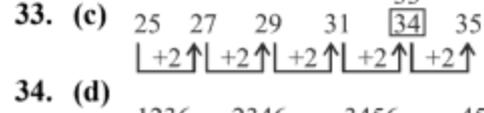
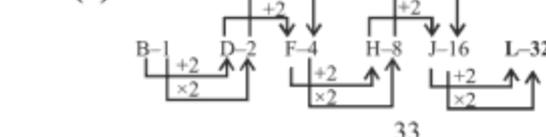
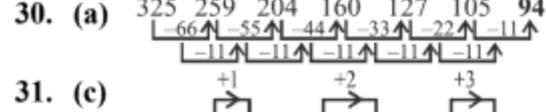
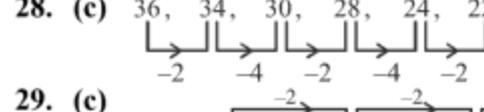
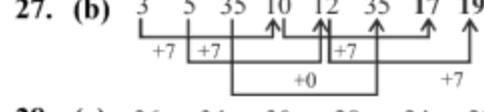
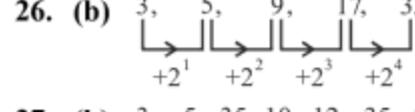
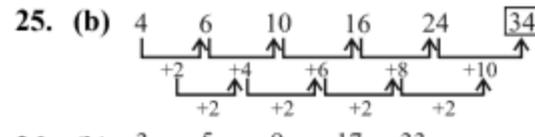
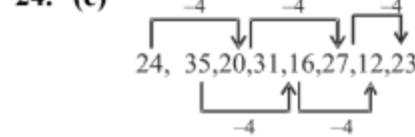
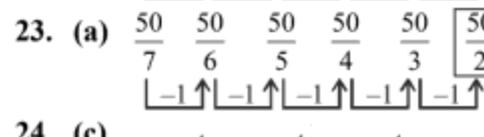
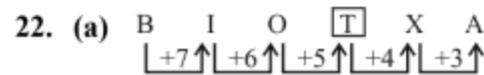
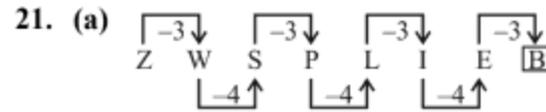
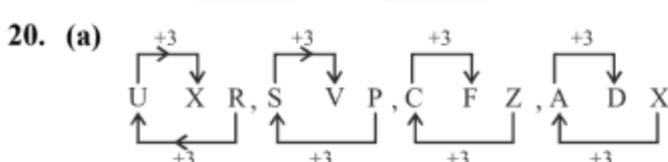
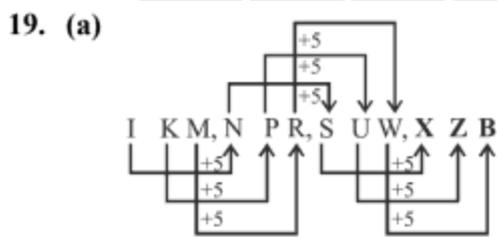
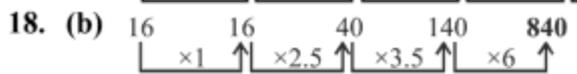
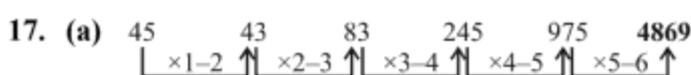
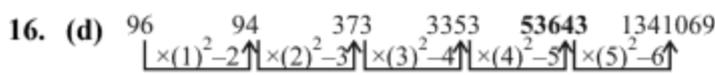
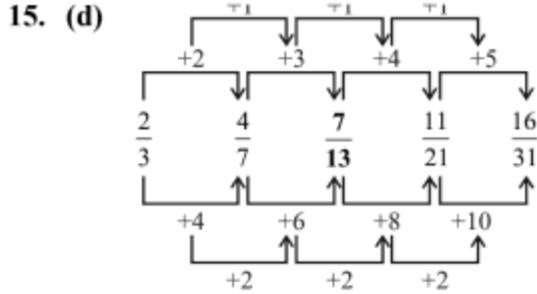
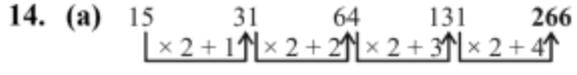
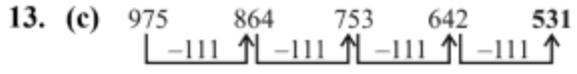
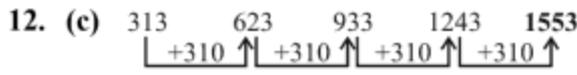
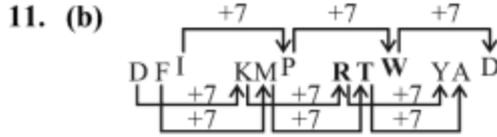
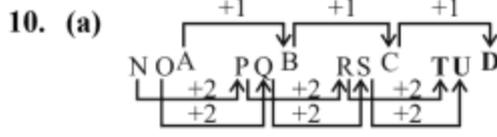
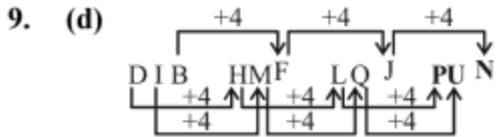
55. 1, 2, 8, 33, 148, 760, 4626  
(a) 760 (b) 14  
(c) 4626 (d) 2
56. 888, 440, 216, 104, 48, 22, 6  
(a) 440 (b) 216 (c) 22 (d) 6
57. Fill in the blank :  
Q4RT, \_\_\_\_\_, QRT6, QR7T, Q8RT  
(a) QTR7 (b) QR5T  
(c) RQ9T (d) TRQ6
58. Fill in the blank :  
257, 291, \_\_\_\_\_, 365, 405  
(a) 313 (b) 322 (c) 327 (d) 343

**DIRECTIONS (Qs. 59-60):** Examine the following numbers and identify the next number:

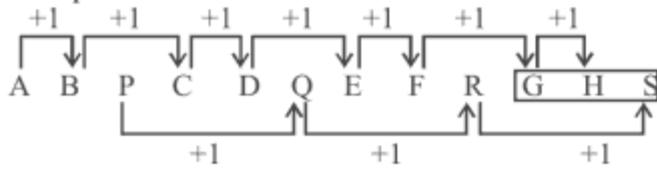
59. 53, 50, 45, 38, 29, \_\_\_\_\_  
(a) 11 (b) 17 (c) 18 (d) 21
60. 20, 30, 42, 56, 72, \_\_\_\_\_  
(a) 82 (b) 90 (c) 92 (d) 94
61. Identify the missing number:  
1 and 3, 4 and 6, 7 and 9, .... and 12  
(a) 10 (b) 11 (c) 12 (d) 13

# Hints & Solutions

1. (c) **b a a b/b a a b/b a a b/b a a b**
2. (c) **m b b/m a a/m b b/m a a/m b b**
3. (d) **a b a a b a a b a a b a a**
4. (b) **LU B TUP/LUBTU P / LUBT U P/L UBTUP]**
5. (a) **B B CCA/BB C CA/BBC C A/B B CCA**
6. (d) **a b/a b/ a b/a b/a b/a b**
7. (b) **SHEELA/SHEELA/SHEELA/SHEELA**
8. (b) **BROWN/BROWN/B**

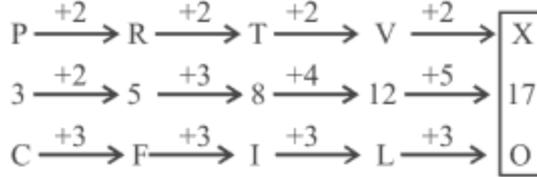


36. (a) The pattern of letter series is as follows:



So, the next term will be GHS.

37. (c) The pattern of the series is as follows:

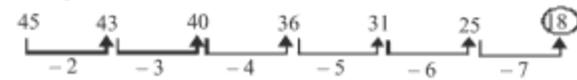


38. (a) The pattern of the series is as follows:

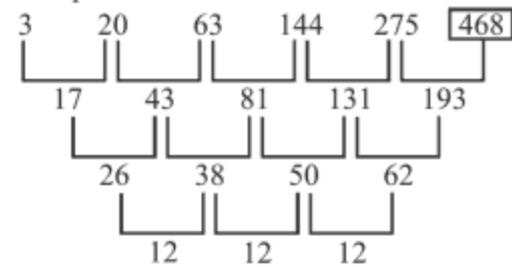


So, the next term will be 405.

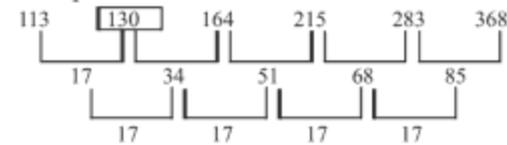
39. (d) The pattern is as follows:



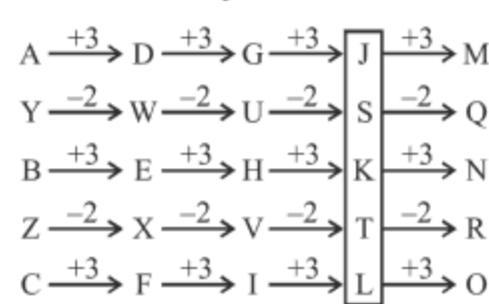
40. (a) The pattern of the series is as follows:



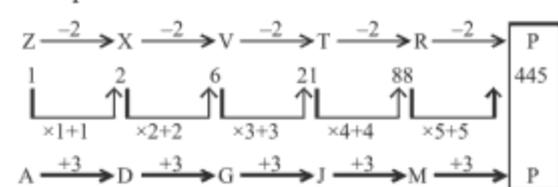
41. (b) The pattern of the series is as follows:



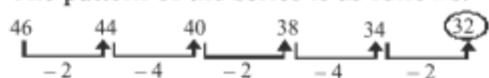
42. (c) Pattern of the sequence is as follows:



43. (d) The pattern of the series is as follows:



44. (b) The pattern of the series is as follows:



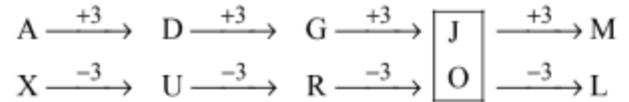
45. (c) Given,



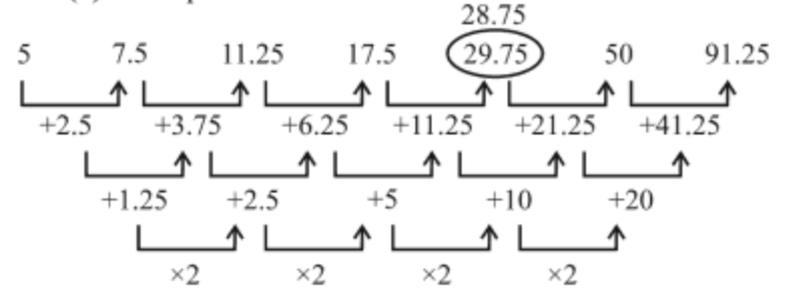
By direct substitution method,

The code for TAIL is 4523.

46. (c) The pattern of the series is as follows :



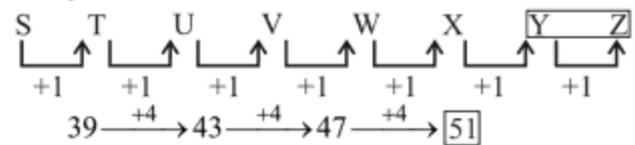
47. (a) The pattern is as follows:



48. (b) The pattern is as follows:

- ⇒ 10 + 16 = 26
- ⇒ 13 + 24 = 37 (Adding 16 + 8 = 24)
- ⇒ 26 + 32 = 58 (Adding 24 + 8 = 32)
- ⇒ 37 + 40 = 77 (Adding 32 + 8 = 40)
- ⇒ 58 + 48 = 106 (Adding 40 + 8 = 48)
- ⇒ 77 + 56 = 133 (Adding 48 + 8 = 56)

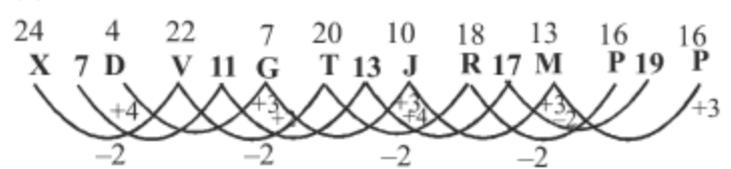
49. (c) The pattern is as follows:



50. (d) The pattern is as follows:

- 13 (168) 13 ⇒ 13 × 13 = 169 - 1 = 168 (Middle number)
- 14 (181) 13 ⇒ 14 × 13 = 182 - 1 = 181 (Middle number)
- and 15 (?) = 13 ⇒ 15 × 13 = 195 - 1 = 194 (Middle number)

51. (b) R 17 M



The first alphabets in the series, i.e. X, V, T follow the trend of deducting -2 from the place value of the alphabet.

The numbers are increasing in +4 and +2 sequence alternately. The second alphabets in the series i.e. D, G, J are increasing by +3.

52. (d) 1

The series is following the trend of divisibility by 3.

