03

Series

Series is a sequential order of terms arranged in such a way that each term in the series is obtained using some specific rules. e.g. In the series, 2, 4, 6, 8, ... the consecutive even numbers are given.

Series may be broadly divided into the following types

1. Number series   2. Letter series

1. Number Series

In this type of questions, we are given a sequence of numbers including one or more missing numbers. This series follows a pattern. Keeping this pattern in mind, we have to find the missing terms.

The pattern can be based on addition/subtraction of numbers, multiplication/division of numbers, square/cube of numbers etc.

Directions (Example 1-3) *Choose the correct alternative from the given ones that will complete the series.*

Example 1 5, 6, 9, 14, 21, ?

(a) 26   (b) 28   (c) 30   (d) 34

Sol. (c)

$$5 \quad 6 \quad 9 \quad 14 \quad 21 \quad \boxed{30}$$
$$+1 \quad +3 \quad +5 \quad +7 \quad +9$$

This sequence consists pattern of addition of consecutive odd numbers. To the previous one.

Example 2 1, 3, 9, 27, 81, ?

(a) 216   (b) 220   (c) 243   (d) 250

Sol. (c)

$$1 \quad 3 \quad 9 \quad 27 \quad 81 \quad 243$$
$$\times 3 \quad \times 3 \quad \times 3 \quad \times 3 \quad \times 3$$

Next number of this series is multiplication of 3 with previous one.

Example 3 71, 55, 46, 42, ?

(a) 40   (b) 41   (c) 39   (d) 38

Sol. (b)

$$71 \quad 55 \quad 46 \quad 42 \quad \boxed{41}$$
$$-4^2 \quad -3^2 \quad -2^2 \quad -1^2$$

This sequence is based on subtraction of squares of natural numbers.

2. Letter Series

In this type, letters of English alphabet are arranged in a particular pattern like reverse order of letters, skipping of letters, position of letters in alphabetical order etc. The candidate has to find the missing term based on that pattern.

Directions (Example 4-6) *Choose the correct alternative from the given ones that will complete the series.*
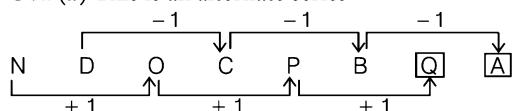
Example 4 J, O, S, ?, X

(a) V   (b) Y   (c) M   (d) N

Sol. (a)

$$J \quad O \quad S \quad \boxed{V} \quad X$$
$$+5 \quad +4 \quad +3 \quad +2$$

Example 5 N, D, O, C, P, B, ?, ?

(a) A, D   (b) B, E   (c) M, P   (d) Q, A

Sol. (d) This is an alternate series

$$N \quad D \quad O \quad C \quad P \quad B \quad \boxed{Q} \quad \boxed{A}$$

-1 (D → C → B → A)

$+1$ (N → O → P → Q)

Example 6 N2, P4, R8, T16, ?

(a) T, 32   (b) M, 28   (c) V, 32   (d) L, 18

Sol. (c)

$$N \xrightarrow{+2} P \xrightarrow{+2} R \xrightarrow{+2} T \xrightarrow{+2} \boxed{V}$$
$$2 \xrightarrow{\times 2} 4 \xrightarrow{\times 2} 8 \xrightarrow{\times 2} 16 \xrightarrow{\times 2} \boxed{32}$$

⏰ Practice Exercise

Directions (Q. Nos. 1-11) *In each of the following questions, a number series is given with one of the terms missing. Choose the correct alternative that will continue the same pattern and replace the question mark (?) in the given series.*

1. 2, 22, 222, 2222, ?
   - (a) 11222
   - (b) 22233
   - (c) 23255
   - (d) 22222

2. 3, 7, 13, 21, ?
   - (a) 31
   - (b) 28
   - (c) 30
   - (d) 36

3. 100, 50, 52, 26, 28, ?
   - (a) 18
   - (b) 16
   - (c) 15
   - (d) 14

4. 4, 9, 20, 43, ?
   - (a) 80
   - (b) 90
   - (c) 75
   - (d) 85

5. 42, 21, 34, 17, 26, ?
   - (a) 13
   - (b) 15
   - (c) 14
   - (d) 10

6. 8, 7, 16, 21, 32, 63, ?
   - (a) 65
   - (b) 64
   - (c) 62
   - (d) 60

7. 18, 25, 22, 20, 26, 15, ?
   - (a) 32
   - (b) 30
   - (c) 25
   - (d) 28

8. 68, 67, 64, 59, ?
   - (a) 52
   - (b) 53
   - (c) 54
   - (d) 56

9. 97, 90, 76, 55, ?
   - (a) 28
   - (b) 27
   - (c) 26
   - (d) 25

10. 11, 15, 38, 126, ?
   - (a) 520
   - (b) 500
   - (c) 400
   - (d) 380

11. 2, 6, 8, 16, 30, 54, ?
   - (a) 74
   - (b) 88
   - (c) 100
   - (d) 110

Directions (Q.Nos. 12-18) *In each of the following questions, various terms of an alphabet series are given with one or more terms missing as shown by (?). Choose the missing terms out of the given alternatives.*

12. A, C, F, J, ?, ?
   - (a) L, P
   - (b) M, O
   - (c) O, U
   - (d) R, V

13. A, D, E, H, I, L, ?, ?
   - (a) M, P
   - (b) M, N
   - (c) M, O
   - (d) M, Q

14. C, F, I, L, O, ?
   - (a) R
   - (b) S
   - (c) T
   - (d) U

15. DF, GJ, KM, NQ, RT, ?
   - (a) UX
   - (b) UW
   - (c) YZ
   - (d) XZ

16. BMW, XDNV, FOU, ?
   - (a) GHO
   - (b) GPS
   - (c) HPS
   - (d) HPT

17. AD, EF, IH, OJ, ?
   - (a) UL
   - (b) OL
   - (c) UT
   - (d) UO

18. ABCD, BCDA, CDAB, ?, ABCD
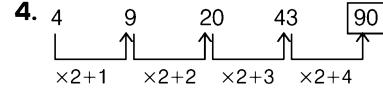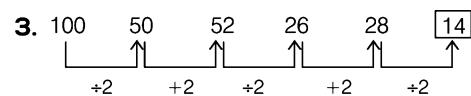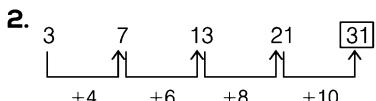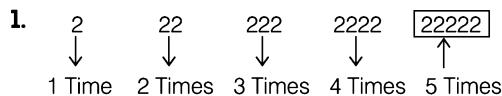   - (a) DADC
   - (b) DABC
   - (c) DBAC
   - (d) DACB

Directions (Q. Nos. 19-20) *What should come in the place of question mark (?) in the following alpha-numeric series?*
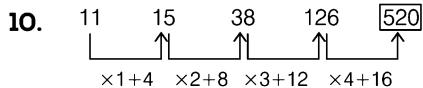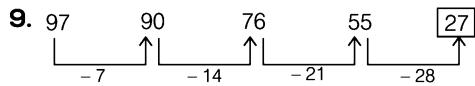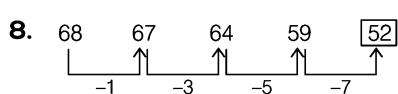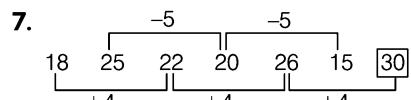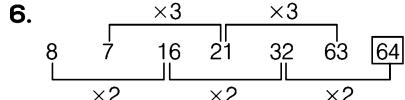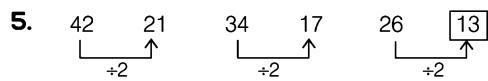
19. A1, C3, F6, J10, O15, ?
   - (a) U21
   - (b) V21
   - (c) T20
   - (d) U20

20. G13T, I11R, L9O, ?
   - (a) P0K
   - (b) P5L
   - (c) P5J
   - (d) P7K

Answers
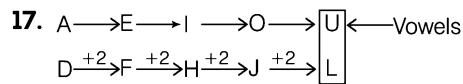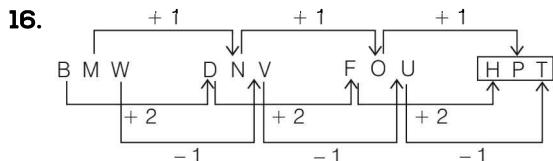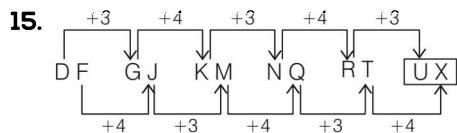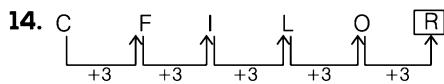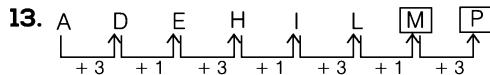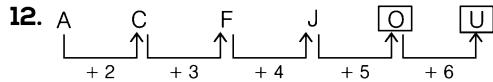
1	(d)	2	(a)	3	(d)	4	(b)	5	(a)	6	(b)	7	(b)	8	(a)	9	(b)	10	(a)
11	(c)	12	(c)	13	(a)	14	(a)	15	(a)	16	(d)	17	(a)	18	(b)	19	(a)	20	(d)

Hints & Solutions

1.

2.

3.

4.

5. 42　21　34　17　26　[13]
　　└─┐↑　└─┐↑　└─┐↑
　　　÷2　　　÷2　　　÷2

6.　　×3　　×3
8　7　16　21　32　63　[64]
└──┐　└──┐　└──┐
　×2　　×2　　×2

7.　　−5　　−5
18　25　22　20　26　15　[30]
└──┐　└──┐　└──┐
　+4　　+4　　+4

8. 68　67　64　59　[52]
└┐↑└┐↑└┐↑└┐↑
　−1　−3　−5　−7

9. 97　90　76　55　[27]
　−7　−14　−21　−28

10. 11　15　38　126　[520]
×1+4　×2+8　×3+12　×4+16
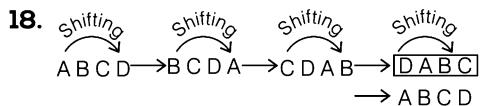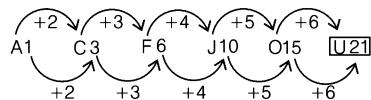
11.　　　2 + 6 = 8,　　　2 + 6 + 8 = 16
　6 + 8 + 16 = 30,　8 + 16 + 30 = 54
　16 + 30 + 54 = [100]

12. A　C　F　J　[O]　[U]
　　+2　+3　+4　+5　+6

13. A　D　E　H　I　L　[M]　[P]
　+3　+1　+3　+1　+3　+1　+3

14. C　F　I　L　O　[R]
　+3　+3　+3　+3　+3

15.　+3　+4　+3　+4　+3
D F　G J　K M　N Q　R T　[U X]
　　+4　+3　+4　+3　+4

16.　　+1　　　+1　　　+1
B M W　D N V　F O U　[H P T]
　+2　　　+2　　　+2
　−1　　　−1　　　−1

17. A⟶E⟶I⟶O⟶[U]←Vowels
D $\xrightarrow{+2}$ F $\xrightarrow{+2}$ H $\xrightarrow{+2}$ J $\xrightarrow{+2}$ [L]

Here, in first series, consecutive vowels are given.
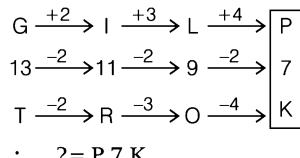
18. *Shifting* *Shifting* *Shifting* *Shifting*
A B C D ⟶ B C D A ⟶ C D A B ⟶ [D A B C]
　　　　　　　　　　⟶ A B C D

19. Pattern of given alpha-numeric series is as follows
　+2　+3　+4　+5　+6
A1　C3　F6　J10　O15　[U21]
　+2　+3　+4　+5　+6

∴ ? = U21

20. Pattern of given alpha-numeric series is as follows

G $\xrightarrow{+2}$ I $\xrightarrow{+3}$ L $\xrightarrow{+4}$ [P]

13 $\xrightarrow{-2}$ 11 $\xrightarrow{-2}$ 9 $\xrightarrow{-2}$ [7]

T $\xrightarrow{-2}$ R $\xrightarrow{-3}$ O $\xrightarrow{-4}$ [K]

∴　? = P 7 K

➡ Try Yourself

Directions (Q.Nos. 1-10) *In each of the following questions, a series is given with one of the terms missing. Choose the correct alternative that will continue the same pattern and replace the question mark (?) in the given series.*

1) 2, 7, 14, 23, 34, ?
　(a) 30　　(b) 32　　(c) 45　　(d) 47

2) 7, 12, 8, 18, 9, 24, 10, ?
　(a) 44　　(b) 27　　(c) 30　　(d) 20

3) 1, 3, 7, 11, 13, 17, ?
　(a) 19　　(b) 20　　(c) 18　　(d) 21

4) 3, 6, 4, 12, 5, 20, 6, ...
　(a) 24　　(b) 15　　(c) 30　　(d) 50

5) 3, 8, 20, 46, 100, ?
　(a) 210　　(b) 225　　(c) 300　　(d) 400

6) A, Z, D, Y, G, X, ?, ?
　(a) AR　　(b) JW　　(c) JV　　(d) MV

7) B , I, P, ?, D
　(a) V　　(b) X　　(c) W　　(d) Z

8) W, T, P, M, I, F, B, ?, ?
　(a) AB　　(b) YU　　(c) YZ　　(d) WX

9) AC, EG, IK, MO, ?
　(a) QS　　(b) QT　　(c) LM　　(d) VW

10) P3C, R5F, T8I, V12L, ?
　(a) Y17O　　(b) X16M　　(c) X17O　　(d) X16O

Answers

1	*(d)*	2	*(c)*	3	*(d)*	4	*(c)*	5	*(a)*
6	*(b)*	7	*(c)*	8	*(b)*	9	*(a)*	10	*(c)*