CHAPTER 03

Series

A series is a sequence of letters or numbers or a combination of both obtained by some particular predefined rule. The candidate is required to study the given series, identify the pattern followed and complete the given series with the most suitable alternative or find the wrong term in the series.

The following types of questions are generally asked in exams related to series.

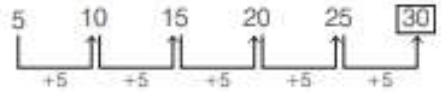
1. Number Series- In these questions, a number series is given following a particular sequence or rule. The candidate has to either complete the series or find the wrong term given at a specific place in the series.

Example 1: Find the missing term in the series

5, 10, 15, 20, 25, ?

(a) 30 (b) 40 (c) 35 (d) 45

Sol. (a) The pattern of the series is,

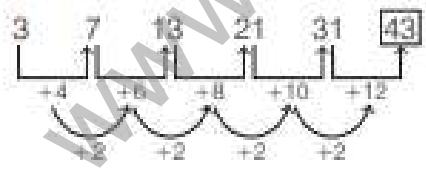


Example 2: Find the missing (?) in the series

3, 7, 13, 21, 31, ?

(a) 41 (b) 42 (c) 43 (d) 44

Sol. (c) The pattern of the series is,

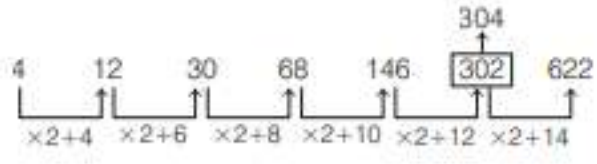


Example 3: Find the wrong term in the series

4, 12, 30, 68, 146, 302, 622

(a) 12 (b) 30 (c) 146 (d) 302

Sol. (d) The pattern of the series is,



2. Letter Series- In this type, a series of letters, either single or in groups is given.

The terms of the series form a definite pattern or sequence as regards the positions of letters in the English alphabet.

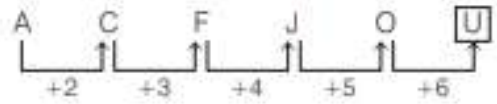
The candidate is required to find out that pattern and apply it to find the missing term.

Example 4: Find the next term in the series

A, C, F, J, O, ?

(a) T (b) U (c) S (d) V

Sol. (b) The pattern of the series is,

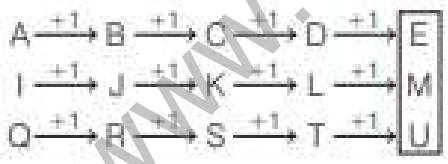


Example 5: Find the next term in the series

AIQ, BJR, CKS, DLT, ?

(a) ENU (b) EMV (c) ENV (d) EMU

Sol. (d) The pattern of the series is,

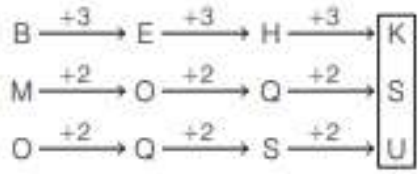


Example 6: Find the next term in the series

BMO, EOQ, HQS, ?

(a) KSU (b) LMN (c) SOV (d) SOW

Sol. (a) The pattern of the series is,



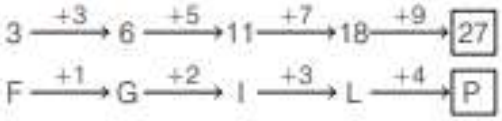
3. Alpha Numeric Series- This series is a combination of letter series and number series which move according to a set pattern. The candidate has to find the pattern for both to get the next term of the series.

Example 7: Find the next term in the series

3 F, 6G, 11 I, 18 L, ?

(a) 21 O (b) 25 N (c) 25 P (d) 27 P

Sol. (d) The pattern of the series is,



Example 8: Choose the missing term.

P 3 C, R 5 F, T 8 I, V 12 L, ?

(a) X 17 O (b) L 12 S (c) X 12 T (d) I 17 O

Sol. (a) The pattern of the series is,

4. Continuous Pattern Series- In this type, a group of letters usually given in small letters are repeated in a systematic way to establish a series. However, some letters are missing from the series. These missing terms are then given in a proper sequence as one of the alternatives. The candidate is required to choose this alternative as the answer.

Example 9: Find the missing letters in the series

mc __ m __ a __ ca __ ca __ c __ mc

(a) acmmma (b) camcam (c) aaccmm (d) acmmca

Sol. (a) The series is m c a / m c a / m c a / m c a / m c a / mc.

So, the missing letters are 'acmmma'.

Example 10: Find the missing letters in the series

b a – c b – b – b a b –

(a) acbb (b) back (c) bcaa (d) cabb

Sol. (b) The series is babc / babc / babc. So, the missing letters are 'bacc'.

5. Conditional Letter, Number and Symbol Sequence- In this type of questions, a jumbled sequence of some letters, numbers and / or symbols are given.

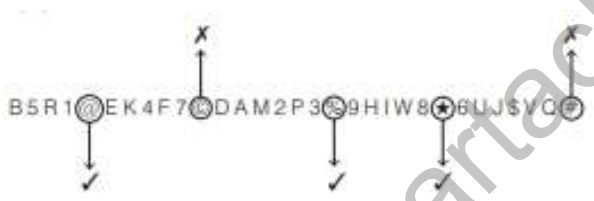
The candidate is required to find the total number of a particular number / letter/ symbol in the sequence applying certain condition.

Example 11: How many such symbols are there in the following arrangement each of which is immediately preceded by a number but not immediately followed by a consonant?

B 5 R 1 @ EK 4 F 7 □ D A M 2 P 3 % 9 H I W 8 * 6 U I $ V Q #

(a) None (b) One (c) Two (d) Three

Sol. (d) Let us see



✓ = Condition fulfilled

✗ = Condition not fulfilled

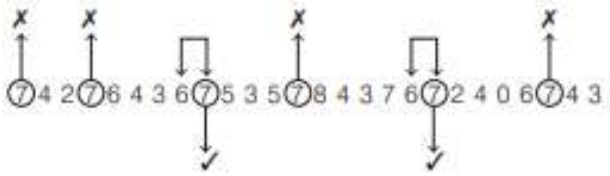
Clearly, there are three such symbols.

Example 12: How many 7's immediately preceded by 6 but not immediately followed by 4 are there in the following series?

7 4 2 7 6 4 3 6 7 5 3 5 7 8 4 3 7 6 7 2 4 0 6 7 4 3

(a) One (b) Two (c) Four (d) Six

Sol. (b) Let us see



✓ = Condition fulfilled

✗ = Condition not fulfilled

Clearly, there are two such 7's.

Practice Questions

Directions (Q. Nos. 1–10) In the following questions, a number series is given with one term missing**. Choose the correct alternative that will continue the pattern.**

1. 6, 9, 12, 15, 18, ?

(a) 21 (b) 20 (c) 19 (d) 22

2. 13, 14, 18, 27, ?, 68, 104

(a) 36 (b) 41 (c) 43 (d) 54

3. 6, 11, 21, 36, 56, ?

(a) 42 (b) 51 (c) 81 (d) 91

4. 1, 1, 8, 4, 27, 9, ?, 16

(a) 32 (b) 48 (c) 64 (d) 72

5. 5, 11, 23, 47, 95, ?

(a) 190 (b) 191 (c) 161 (d) 169

6. 10, 14, 28, 32, 64, 68, ?

(a) 132 (b) 72 (c) 136 (d) 86

7. 325, 259, 204, 160, 127, 105, ?

(a) 94 (b) 96 (c) 98 (d) 100

8. 82, 70, 76, 64, 70, 58, ?

(a) 52 (b) 76 (c) 64 (d) 48

9. 1, 5, 14, 30, 55, 91, ?

(a) 130 (b) 140 (c) 150 (d) 160

10. 3, 15, 4, 16, 5, 17, 6, ?, 7

(a) 12 (b) 13 (c) 15 (d) 18

Directions (Q. Nos. 11–18) In the following questions, one term in the number series is wrong. **Find out the wrong term.**

11. 3, 10, 27, 4, 16, 64, 5, 25, 125

(a) 3 (b) 4 (c) 10 (d) 27

12. 5, 27, 61, 122, 213, 340, 509

(a) 27 (b) 61 (c) 122 (d) 509

13. 4, 10, 22, 46, 96, 190, 382

(a) 4 (b) 10 (c) 96 (d) 382

14. 125, 126, 124, 127, 123, 129

(a) 126 (b) 124 (c) 123 (d) 129

15. 15, 16, 22, 29, 45, 70

(a) 16 (b) 22 (c) 45 (d) 70

16. 2, 6, 24, 96, 285, 568, 567

(a) 6 (b) 24 (c) 285 (d) 567

17. 1, 3, 12, 25, 48

(a) 3 (b) 12 (c) 25 (d) 48

18. 1, 5, 5, 9, 7, 11, 11, 15, 12, 17

(a) 11 (b) 12 (c) 17 (d) 15

Directions (Q. Nos. 19-28) In the following questions, the terms of an alphabet series are given with one or more terms missing. Choose the missing terms.

19. T, R, P, N, L, ?, ?

(a) J, G (b) J, H (c) K, H (d) K, I

20. H, I, K, N, ?

(a) O (b) Q (c) R (d) S

21. A, I, P, V, A, E, ?

(a) E (b) F (c) G (d) H

22. E, J, ?, T, Y, D

(a) B (b) O (c) F (d) J

23. AI, BJ, CK, ?

(a) DL (b) DM (c) GH (d) LM

24. AZ, CX, FU, ?

(a) IR (b) IV (c) JQ (d) KP

25. PMT, OOS, NQR, MSQ, ?

(a) LUP (b) LVP (c) LVR (d) LWP

26. BCA, FGE, ?, NOM, RSQ, VWU

(a) IJH (b) KLJ (c) KJI (d) JKI

27. ADGJ, CFIL, EHKN, ?

(a) FILO (b) HKNQ (c) DGJM (d) GJMP

28. CBDA, GFHE, KJLI, ?

(a) NOPM (b) MNOP (c) PMNO (d) ONPM

Directions (Q. Nos. 29-36) In the following questions, a alpha-numeric series is given with one or more terms missing. **Choose the missing term.**

29. 2B, 4C, 8E, 14H, ?

(a) 16 K (b) 20 I (c) 20 L (d) 22L

30. 2, A, 9, B, 6, C, 13, D, ?

(a) 9 (b) 10 (c) 12 (d) 19

31. KM5, IP8, GS11, EV14,?

(a) BX17 (b) BY17 (c) CY17 (d) CY18

32. C4X, F9U, I16R, ?

(a) K 25 P (b) L 25 P (c) L 25 O (d) L 27 P

33. 2 Z 5, 7 Y 7, 14 X 9, 23 W 11, 34 V 13, ?

(a) 27 U 24 (b) 45 U 15 (c) 47 U 15 (d) 47 V 14

34. N 5 V, K 7 T, ?, E 14 P, B 19 N

(a) H 9 R (b) H 10 Q (c) H 10 R (d) I 10 R

35. Q1F, S 2 E, U 6 D, W 21 C, ?

(a) Y 44 B (b) Y 66 B (c) Y 88 B (d) Z 88 B

36. 2 A 11, 4 D 13, 12 G 17, ?

(a) 36 I 19 (b) 36 J 21 (c) 48 J 21 (d) 48 J 23

Directions (Q. Nos. 37-45) In the following letter series, some letters are missing which are given in that order as one of the alternatives. **Choose the correct alternative.**

37. ab _ _ baa _ _ ab _

(a) aaaaa (b) aabaa (c) aabab (d) baabb

38. a _ ba _ b _ _ a _b

(a) abaab (b) abbab (c) aabba (d) bbabb

39. bca _ b _ aabc _ a _ caa

(a) acab (b) bcbb (c) cbab (d) ccab

40. ab _ d _ aaba _ na _ bad na _ b

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

41. a _ bbc _ aab _ cca _ bbcc

(a) bacb (b) acba (c) abba (d) caba

42. _ a _ b _ abaa _ bab _ abb

(a) aaabb (b) ababb (c) babab (d) babba

43. ac_cab_baca_aaa_aba

(a) aabc (b) aacb (c) babb (d) bcbb

44. abca_bcaab_ca_bbc_a

(a) ccaa (b) bbaa (c) abac (d) abba

45. a _ bccb _ ca _ cca _ baab_c

(a) ababc (b) abcaa (c) accab (d) bacaa

46. How many 4's are there in the series which comes between two 5's ?

3 4 4 5 4 5 4 2 1 4 5 4 5 7 4 5 4 5

(a) 4 (b) 5 (c) 6 (d) 3

47. How many 7's are there in the given series which are immediately preceded by 6 but not immediately followed by 8?

3 4 8 7 6 1 5 6 7 8 4 9 6 7 5

(a) 1 (b) 2 (c) 3 (d) 4

48. In the following series of numbers, find out how many times 1, 3 and 7 have appeared together, 7 being in the middle and 1 and 3 on either side of 7?

2 9 3 1 7 3 7 7 7 1 3 3 1 7 3 8 5 7 1 3 7 7 1 7 3 9 0 6

(a) 3 (b) 4 (c) 5 (d) None of these

49. How many even numbers are there in the following sequence of numbers each of which is immediately followed by an odd number as well as immediately preceded by an even number?

8 6 7 6 8 9 3 2 7 5 3 4 2 2 3 5 5 2 2 8 1 1 9

(a) One (b) Three (c) Five (d) None of these

50. How many times n comes before p in the given series?

m s t n p z x n p n p q y n p r a n p s t

(a) 2 (b) 3 (c) 4 (d) 5

51. In the following series, how many Ks are there which are immediately preceded by N and immediately followed by U?

ABCDKNLJMNKSTRZNKUANKUBWXNKLS

(a) 6 (b) 2 (c) 3 (d) 4

52. Which of the following is the 10th to the right of the 19th from the right end of the below arrangement?

F 4 □ T 2 E % M P 5 W 9 @ L Q R 6 U H 3 Z 7 * A T B 8 V # G $ Y D

(a) M (b) T (c) # (d) 2

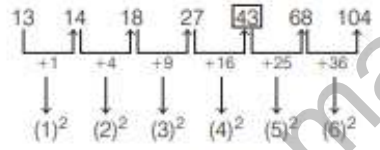
ANSWERS

1.	(a)	**2.**	(c)	**3.**	(c)	**4.**	(c)	**5.**	(b)	**6.**	(c)	**7.**	(a)	**8.**	(c)	**9.**	(b)	**10.**	(d)
11.	(c)	**12.**	(a)	**13.**	(c)	**14.**	(d)	**15.**	(b)	**16.**	(b)	**17.**	(c)	**18.**	(b)	**19.**	(b)	**20.**	(c)
21.	(d)	**22.**	(b)	**23.**	(a)	**24.**	(c)	**25.**	(a)	**26.**	(d)	**27.**	(d)	**28.**	(d)	**29.**	(d)	**30.**	(b)
31.	(c)	**32.**	(c)	**33.**	(c)	**34.**	(c)	**35.**	(c)	**36.**	(d)	**37.**	(b)	**38.**	(d)	**39.**	(a)	**40.**	(a)
41.	(b)	**42.**	(d)	**43.**	(a)	**44.**	(c)	**45.**	(a)	**46.**	(d)	**47.**	(a)	**48.**	(a)	**49.**	(d)	**50.**	(d)
51.	(b)	**52.**	(b)																

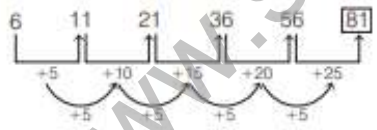
Hints & Solutions:

1. (a) The pattern of the series is,

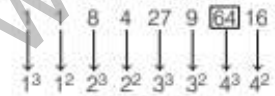
2. (c) The pattern of the series is,



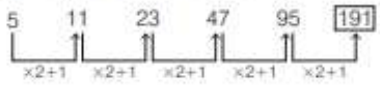
3. (c) The pattern of the series is,



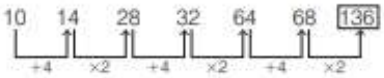
4. (c) The pattern of the series is,



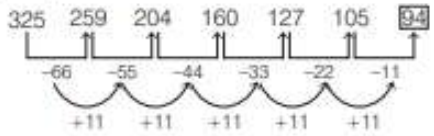
5. (b) The pattern of the series is,



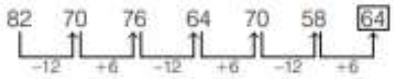
6. (c) The pattern of the series is,



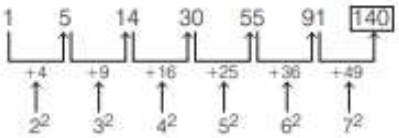
7. (a) The pattern of the series is,



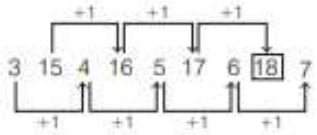
8. (c) The pattern of the series is,



9. (b) The pattern of the series is,



10. ((a)) The pattern of the series is,

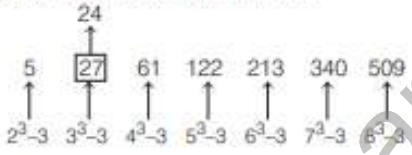


11. (c) The correct sequence is

$3, 3^2, 3^3, 4, 4^2, 4^3, 5, 5^2, 5^3$

So, 10 is wrong and must be replaced by 3^2 i.e. 9.

12. (a) The pattern of the series is,

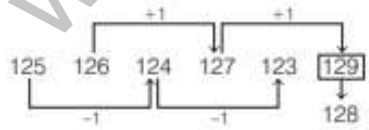


So, 27 is the wrong term.

13. (c) The pattern of the series is,

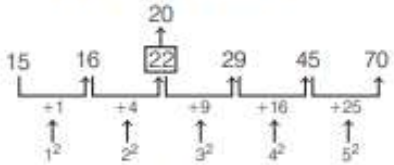
So, 96 is the wrong term.

14. (d) The pattern of the series is,



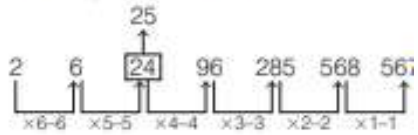
So, 129 is the wrong term.

15. (b) The pattern of the series is,



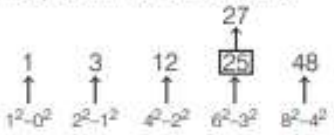
So, 22 is the wrong term.

16. (b) The pattern of the series is,



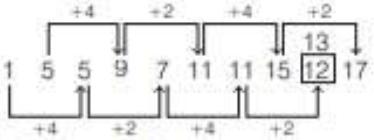
So, 24 is the wrong term.

17. (c) The pattern of the series is,



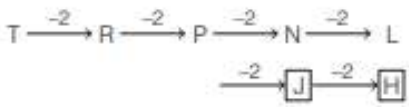
So, 25 is the wrong term.

18. (b) The pattern of the series is,

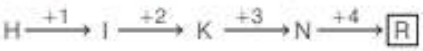


So, 12 is the wrong term.

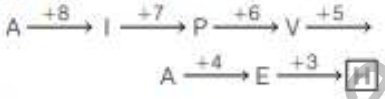
19. (b) The pattern of the series is,



20. (c) The pattern of the series is,

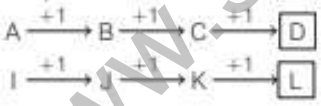


21. (d) The pattern of the series is,

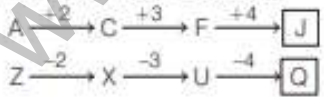


22. (b) The pattern of the series is,

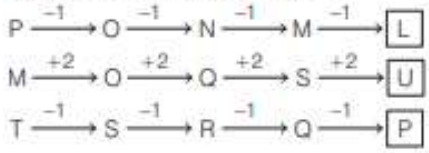
23. (a) The pattern of the series is,



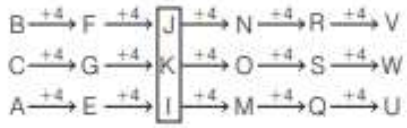
24. (c) The pattern of the series is,



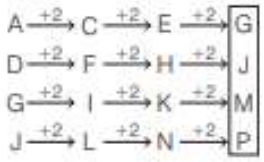
25. (a) The pattern of the series is,



26. (d) The pattern of the series is,

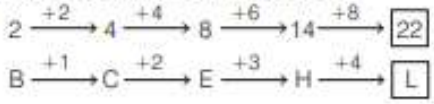


27. (d) The pattern of the series is,

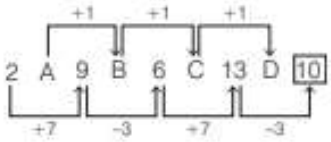


28. (d) The pattern of the series is,

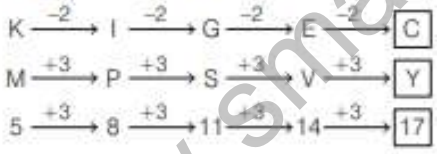
29. (d) The pattern of the series is,



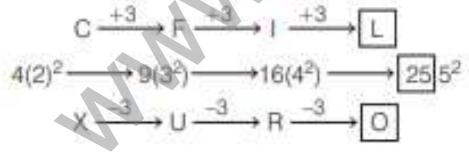
30. (b) The pattern of the series is,



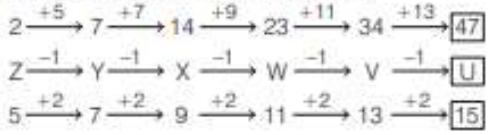
31. (c) The pattern of the series is,



32. (c) The pattern of the series is,



33. (c) The pattern of the series is,



34. (c) The pattern of the series is,

$N \xrightarrow{-3} K \xrightarrow{-3} \boxed{H} \xrightarrow{-3} E \xrightarrow{-3} B$

$5 \xrightarrow{+2} 7 \xrightarrow{+3} \boxed{10} \xrightarrow{+4} 14 \xrightarrow{+5} 19$

$V \xrightarrow{-2} T \xrightarrow{-2} \boxed{R} \xrightarrow{-2} P \xrightarrow{-2} N$

35. (c) The pattern of the series is,

$Q \xrightarrow{+2} S \xrightarrow{+2} U \xrightarrow{+2} W \xrightarrow{+2} \boxed{Y}$

$1 \xrightarrow{\times1+1} 2 \xrightarrow{\times2+2} 6 \xrightarrow{\times3+3} 21 \xrightarrow{\times4+4} \boxed{88}$

$F \xrightarrow{-1} E \xrightarrow{-1} D \xrightarrow{-1} C \xrightarrow{-1} \boxed{B}$

36. (d) The pattern of the series is,

$2 \xrightarrow{\times2} 4 \xrightarrow{\times3} 12 \xrightarrow{\times4} \boxed{48}$

$A \xrightarrow{+3} D \xrightarrow{+3} G \xrightarrow{+3} \boxed{J}$

$11 \xrightarrow{+2} 13 \xrightarrow{+4} 17 \xrightarrow{+6} \boxed{23}$

37. (b) The series is ab a / ab a / a b a / ab a. So, the missing letters are aabaa

38. (d) The series is a b /a b / a b / a b b. Thus, the pattern 'abb' is repeated.

39. (a) The series is b c a a / b c a a / b c a a/ b c a a. Thus, the pattern 'bcaa' is repeated.

40. (a) The series is abadna / abadna/ abadna / ab. Thus, the pattern 'abadna' is repeated.

41. (b) The series is aabbcc / aabbcc / aa bbcc. Thus, the pattern 'aabbcc' is repeated.

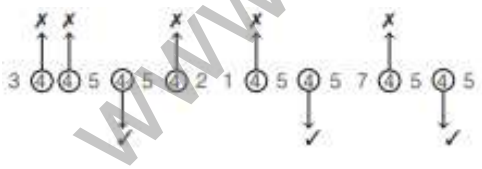
42. (d) The series is baa / bba/ baa / bba / baa / bb. Thus, the pattern baa / bba is repeated.

43. (a) The series is a c a / c a b / a b a/ c a b / a a a / c a b / a.

44. (c) The series is abc /aabc/aabbc/aabbc/a.

45. (a) The series is aabcc / bbcaa / ccabb /aabcc. Thus, the pattern move in a cyclic order and in each group, the middle letter occurs only once.

46. (d)

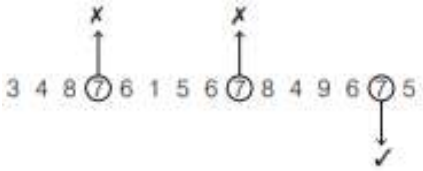


✓ = Condition fulfilled

✗ = Condition not fulfilled

∴ Required 4 = 3 times

47. (a)



✓ = Condition fulfilled

✗ = Condition not fulfilled

∴ Required 7 = 1 time

48. (a) Clearly, the given number series is as follows

2 9 3 [1 7 3] 7 7 7 1 3 3 [1 7 3] 8 5 7
1 3 7 7 [1 7 3] 9 0 6

∴ Required pattern

$$= \frac{1/3}{\text{Preceding}} \quad \frac{7}{\text{middle}} \quad \frac{1/3}{\text{following}}$$

Therefore, total number of such patterns = 3

49. (d) Clearly, the given sequence of numbers is as follows

8 6 7 6 [8] 9 3 2 7 5 3 4 2 [2] 3 5 5 2 2 [8] 1 1 9

Required pattern

$$= \frac{\text{Even number}}{\text{Preceded}} \quad \frac{\text{Even number}}{\text{Middle}} \quad \frac{\text{Odd number}}{\text{Followed}}$$

So, total number of such even numbers = Four

50. (d) m s t n p z x n p n p q y n p r a n p s t

Clearly, required number of n = 5 times

51. (b)

✓ = Condition fulfilled

✗ = Condition not fulfilled

∴Required number of K = 2 times

52. (b)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	
F	4	©	T	2	E	%	M	P	5	W	9	@	L	
15	16	17	18	19	20	21	22	23	24	25	26			
Q	R	6	U	H	3	Z	7	*	A	T	B			
27	28	29	30	31	32	33								
8	V	#	G	$	Y	D								

Total terms = 33

∴19th term from right = (33 + 1) 19 = 34 − 19

= 15 th from left = Q

∴ 10th term to the right of 19th term

= 10th term to the right of Q

= (15 + 10)th = 25th term from left = T