MATRIX OLYMPIAD

The Most Innovative Talent Recognition Exam

LOGICAL REASONING & IQ

Class - IX

MATRIX

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Few words for the Readers

Dear Reader,

"*Matrix Olympiad is established to encourage school students to go a step further than their regular studies, and get a chance and exposure to competition on a wide scale. It also helps students enhance their learning of basic cognitive skills and deeper knowledge of subjects like Science, Mathematics, English, Mental Ability, Social Studies.“Matrix Olympiad helps students nurture their minds for higher targets of tomorrow and enables them to study School for JEE, NEET, CLAT, NDA, Olympiads , NSEJS, NTSE , STSE etc.*"

The above thought has been our guiding principle while designing and collating the study material for **Matrix Olympiad** . And hence, we hope that this particular material will be helpful towards your preparation for **Matrix Olympiad**.

Our team at **MATRIX** has put in their best efforts for making this particular module interesting and relevant for you. Additional efforts have been made to ensure that the content is easy to understand and error free to the extent possible. However, there might remain some inadvertent errors in answer keys and theoretical portion and we would welcome your valuable feedback regarding the same.

If there are any suggestions for corrections, please write to us at **smd@matrixacademy.co.in** and we would be highly grateful.

Finally, we would like to end this message by a famous quote by Ernest Hemingway - "*There is no friend as loyal as a book*." So, please give your study material the time and attention it deserves, and it will surely help you reach newer heights in your fight with competition examinations.

With love and best wishes !

Team MATRIX

CONTENTS

VERBAL : SERIES 1

INTRODUCTION

Series completion problem deals with numbers, alphabets and both together. While attempting to solve the question, you have to check the pattern of the series. Series moves with certain mathematical operations. You have to check the pattern. Type of questions asked in the examination :

(i) Find the missing term (s) (ii) Find the wrong term (s)

1. NUMBER SERIES

Some Important Patterns :

(i) a, a ± d, a ± 2d, a ± 3d ..... (Arithmetic Progression)

(ii) a, ak, ak^2, ak^3,.... (Geometric Progression)

(iii) $a, \frac{a}{k}, \frac{a}{k^2}, \frac{a}{k^3}$,..... (Geometric Progression)

(iv) Series of prime numbers - i.e. 2, 3, 5, 7, ...

(v) Series of composite numbers - i.e. 4, 6, 8, 9, 10, 12, ...

Classification :

I. Two-tier Arithmetic Series :

In an arithmetic series the difference of any two successive numbers is fixed. A two-tier arithmetic series shall be the one in which the differences of successive numbers themselves form an arithmetic series.

For Example :

(a) 1, 2, 5, 10, 17, 26, 37 .....

(b) 3, 5, 9, 15, 23, 33 .....etc. are examples of such series.

In (a) 1, 2, 5, 10, 17, 26, 37 ..... ; the difference of successive numbers are 1, 3, 5, 7, 9, 11 ..... which is a two tier arithmetic series.

Note : Two-tier arithmetic series can be denoted as a quadratic function. For example, the above series is $0^2 + 1$, $1^2 + 1$, $2^2 + 1$, $3^2 + 1$ ..... which can be denoted as $f(x) = x^2 + 1$, where x = 0,1,2.....

Similarly, example (b) can be denoted as $f(x) = x^2 + x + 3$, where x = 0, 1, 2, 3 .....

II. Three-tier Arithmetic Series :

This, as the name suggests, is a series in which the differences of successive numbers form a two-tier arithmetic series ; whose successive term's differences, in term, form an arithmetic series.

For example : 336, 210, 120, 60, 24, 6, 0 ..... is an example of three tier arithmetic series.

[The differences of successive terms are 126, 90, 60, 36, 18, 6 .....

Which is an two-tier arithmetic series]

Note : Three-tier arithmetic series can be denoted as a cubic function. For example, the above series is (from right end) $1^3 - 1$, $2^3 - 2$, $3^3 - 3$, $4^3 - 4$, ... which can also be denoted as $f(x) = x^3 - x$, x = 1, 2 .....

III. Twin Series :

We shall call these twin series, because they are two series packed in one.

1, 3, 5, 1, 9, –3, 13, –11, 17 .....is an example of twin series. In this series two series are 1, 3, 9, 13, 17,.....and 3, 1, –3, –11, ...

IV. Multiple Series :

A multiple series is a mixture of more than one series.

4, 27, 16, 125, 36, 343 ..... is an example of multiple series.

2. ALPHABET SERIES (SERIES OF LETTERS)

♦ **Pattern of Alphabets show Variation Based on :**

(i) Position of the Alphabets (ii) Difference between the alphabets

Position of alphabets :

• **Alphabets in order :**

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

• **Alphabets in reverse order :**

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

3. LETTERS REPEATING SERIES

Pattern of such questions is that some letters in sequence are missing.

(i) The letters may be in cyclic order (clockwise or anti-clockwise).

(ii) To solve a problem, we have to select one of the alternative from the given alternatives. The alternative which gives a sequence of letters is the choice.

SOLVED EXAMPLES

NUMBER SERIES

Directions (1– 2) : Find the missing numbers :

SE. 1

16, 19, 22, 25, ?

(A) 23 (B) 28

(C) 29 (D) 21

Ans. As per series a, a + d, a + 2d, ...

a = 16

d = 3

a + 4d = 16 + 4 × 3

Hence, the answer is (B).

SE. 2

1, 1, 4, 8, 9, ?, 16, 64

(A) 27 (B) 28

(C) 29 (D) 21

Ans. (i) 1, 4, 9, 16 $[1^2, 1^3, 2^2, 2^3, 3^3.....]$

(ii) 1, 8, ___, 64 mixed combination

Hence, the answer is (A).

Directions (3– 5) : Find the wrong numbers :

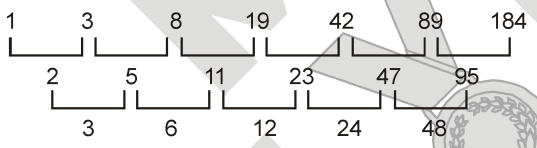
SE. 3

1, 3, 8, 19, 42, 88, 184

(A) 77 (B) 88

(C) 184 (D) 42

Ans.



Hence, number 88 is wrong and should be replaced by 89.

or 1 × 2 + 1, 3 × 2 + 2, 8 × 2 + 3, 19 × 2 + 4, 42 × 2 + 5, 89 × 2 + 6

Hence, the answer is (B).

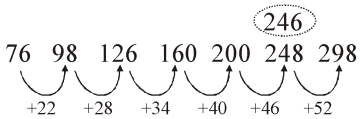
SE. 4

76, 98, 126, 160, 200, 248, 298

(A) 126 (B) 160

(C) 200 (D) 248

Ans.



So, 246 will be at the place of 248.

Hence, the answer is (D).

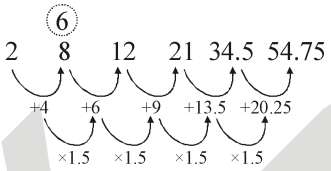
SE. 5

2, 8, 12, 21, 34.5, 54.75

(A) 2 (B) 8

(C) 34.5 (D) 21, 34.5, 54.75

Ans.



So, 6 will be at the place of 8.

Hence, the answer is (B).

ALPHABET SERIES

Directions (6–8) : Find the missing term :

SE. 6

A, C, F, J, ?,?

(A) L, P (B) M, O

(C) O, U (D) R, V

Ans. Clearly the first, second, third,.....letters of the series are respectively moved two, three, four, ... steps forward to obtain the successive terms of the series.

Thus, the fifth term in the series must be a letter which is five steps ahead of J i. e. O, while the sixth must be a letter six steps ahead of O i. e. U.

Thus, we have the following pattern :

$$A \xrightarrow{+2} C \xrightarrow{+3} F \xrightarrow{+4} J \xrightarrow{+5} O \xrightarrow{+6} U$$

So, the missing terms are O and U.

Hence, the answer is (C).

SE. 7

AC, FH, KM, PR, ?

(A) UW (B) VW

(C) UX (D) TV

Ans. Clearly, the first and second letters of each term are moved five steps forward to obtain the corresponding letters of the next term.

Thus, the first letter of the missing term must be five steps ahead of P i.e.U, while the second letter must be five steps ahead of R i.e. W.

So, the missing term is UW.

Hence, the answer is (A).

SE. 8

BMO, EOQ, HQS,?
(A) KSU
(B) LMN
(C) SOV
(D) SOW

Ans. Clearly, we observe the following pattern :
The first letters follow the pattern +3 i.e. B $\xrightarrow{+3}$ E $\xrightarrow{+3}$ H $\xrightarrow{+3}$ (K)
The second letters follow the pattern +2 i.e. M $\xrightarrow{+2}$ O $\xrightarrow{+2}$ Q $\xrightarrow{+2}$ (S)
The third letters follow the pattern +2 i.e. O $\xrightarrow{+2}$ Q $\xrightarrow{+2}$ S $\xrightarrow{+2}$ (U)
Thus, the missing term is KSU.
Hence, the answer is (A).

SE. 9

Find the next term in the alpha-numeric series :
Z1A, X2D, V6G, T21J, R88M, P445P, ?
(A) N2676S (B) N2676T
(C) T2670N (D) T2676N

Ans. Clearly, the pattern followed by the letters are follows :
1st letter : Z $\xrightarrow{-2}$ X $\xrightarrow{-2}$ V $\xrightarrow{-2}$ T $\xrightarrow{-2}$ R $\xrightarrow{-2}$ P $\xrightarrow{-2}$ (N)
2nd letter : A $\xrightarrow{+3}$ D $\xrightarrow{+3}$ G $\xrightarrow{+3}$ J $\xrightarrow{+3}$ M $\xrightarrow{+3}$ P $\xrightarrow{+3}$ (S)
The series formed by the numberals i.e. 1, 2, 6, 21, 88, 445,.....follows the pattern
×1 + 1, ×2 + 2, ×3 + 3, ×4 + 4, ×5 + 5,.....
So, numeral in the desired term
= 445 × 6 + 6 = 2676.
Hence, desired term is N2676S.
Hence, the answer is (A).

SE. 10

Find the term which does not fit into the series given below :
G4T, J10R, M20P, P43N, S90L
(A) G4T (B) J10R
(C) M20P (D) P43N

Ans. The pattern followed by the letters are :
1st letter : G $\xrightarrow{+3}$ J $\xrightarrow{+3}$ M $\xrightarrow{+3}$ P $\xrightarrow{+3}$ S
3rd letter : T $\xrightarrow{-2}$ R $\xrightarrow{-2}$ P $\xrightarrow{-2}$ N $\xrightarrow{-2}$ L
The number–series 4,10,20,43,90 should follow the pattern × 2 + 1, × 2 + 2, × 2 + 3, × 2 + 4.
So, 10 is wrong and must be replaced by (4 × 2 + 1) i.e.9.
Thus, the term J10R does not fit in the given series. The correct term is J9R.
Hence, the answer is (B).

LETTER REPEATING SERIES

Directions (11 – 12) : Which sequence of letters when placed at the blanks one after the other will complete the given letter series ?

SE. 11

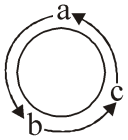
a_ab_ba_a_ab
(A) babb
(B) abba
(C) baba
(D) aabb

Ans. We proceed step by step to solve the above series:
Steps :
1. We have two letters 'a' and 'b' making the series.
2. The first blank space should be filled in by 'b' so that we have one 'a' followed by one 'b'.
3. Second blank space should be filled in by 'a' so that the same pattern followed till end.
Hence, the answer is (A).

SE. 12

a_cab_a_c_bc
(A) bbac
(B) abab
(C) abba
(D) bcba

Ans.



Series is abc/abc/abc/abc. So, pattern abc is repeated.
Hence, the answer is (D).

SE. 13

The series given below is based in the letter series, In the series, some letters are missing. Select the correct alternative. If more than five letters are missing, select the last five letters of the series.
xyzu_yz_v_ _uv_ _ _ _ _ _ _
(A) uvxyz (B) vuzyx
(C) uvzyx (D) vuxyz

Ans. xyzuv | yzuvx | zuvxy | u v x y z
Thus the letters are written in a cyclic order.
Hence, the answer is (A).

SE. 14

There is a letter series in the first row and a number series in the second row. Each number in the number series stands for a letter in the letter series. Since in each of that series some term are missing you have to find out as to what those terms are, and answer the questions based on these as given below in the series.
_m l a x _ l r x a _ _ m a _ _ _ _ _ _
4 _ 5_ 7 3 _ _ _ 6 _ _ _ _ _ _ _ _ _ _
The last five term of the letter series are
(A) rmxla (B) xmral
(C) xrmal (D) rmlxa

Ans. a = 6, l = 5, m = 3, r = 4 and x = 7 the letter series runs as rmlax, mlrxa, lrmax, rmlxa. By taking the letter in the group of five, we find that first letter of the first group is the third letter of the second group and the last two letters have inter-changed their positions. The same rule applies in other groups also.
Hence, the answer is (D).

Space for Notes :

EXERCISE – I

Directions (1–58) : Find the missing numbers :

1. 2, 3, 5, 7, ?
   (A) 9 (B) 10 (C) 11 (D) 14
2. 0, 6, 20, 42, ?
   (A) 64 (B) 72 (C) 80 (D) 84
3. 3, 8, 35, 48, ? , 120
   (A) 72 (B) 64 (C) 80 (D) 99
4. 4, 25, 64, 121, 196, ?
   (A) 384 (B) 256 (C) 225 (D) 289
5. 210, 120, ?, 24, 6, 0
   (A) 64 (B) 48 (C) 35 (D) 60
6. 2, 12, 36, 80, 150, ?
   (A) 194 (B) 210 (C) 252 (D) 258
7. 4, 10, 22, 46, ?
   (A) 56 (B) 66 (C) 76 (D) 94
8. 8, 15, 28, 53, ?
   (A) 120 (B) 106 (C) 104 (D) 102
9. 4, 8, 12, 24, 36, 72, ?
   (A) 98 (B) 100 (C) 144 (D) 108
10. 12, 15, 18, 21, ?
    (A) 24 (B) 23 (C) 22 (D) 25
11. 3, 6, 12, 24, ?, 96
    (A) 84 (B) 50 (C) 52 (D) 48
12. 2, 10, 19, 29, 40, 52, 65, 79, 94, ?
    (A) 110 (B) 109
    (C) 108 (D) None of these
13. 4, 7, 3, 6, 2, 5, ?
    (A) 6 (B) 5 (C) 3 (D) 1
14. 4, 7, 10, 11, 22, 17, 46, 25, ?
    (A) 58 (B) 69 (C) 86 (D) 94
15. 2, 2, 4, 4, 6, 8, 8, ?
    (A) 10 (B) 12 (C) 14 (D) 16
16. 480, 480, 240, 80, 20, ?
    (NTSE Stage-II, 2007)
    (A) 4 (B) 1 (C) 5 (D) 10
17. 1, 1, 2, 2, 3, 4, 4, 8, 5, 16, ?
    (NTSE Stage-II, 2007)
    (A) 6 (B) 32 (C) 8 (D) 7
18. 2, 5, 11, 23, 47, ?
    (NTSE Stage-II, 2007)
    (A) 92 (B) 90 (C) 95 (D) 91
19. 12, 21, 23, 32, 34, 43, 45, ?
    (NTSE Stage-II, 2007)
    (A) 54 (B) 48 (C) 77 (D) 9
20. 14, 1, 21, 4, 28, 9, ?, ?
    (NTSE Stage-II, 2007)
    (A) 9, 42 (B) 16, 35
    (C) 35, 16 (D) 16, 36
21. 4, 9, 19, 34, 54, ?
    (NTSE Stage-II, 2008)
    (A) 66 (B) 75 (C) 79 (D) 84
22. 31, 29, 24, 22, 17, ?, ?
    (NTSE Stage-II, 2008)
    (A) 15, 13 (B) 10, 8
    (C) 14, 12 (D) 15, 10
23. 3, 6, 11, 18, ?
    (NTSE Stage-II, 2008)
    (A) 19 (B) 27 (C) 30 (D) 37
24. 3, 8, 15, 24, ?
    (NTSE Stage-II, 2008)
    (A) 30 (B) 35 (C) 36 (D) 49
25. 5, 9, 17, 33, ?, 129
    (NTSE Stage-II, 2009)
    (A) 72 (B) 67 (C) 65 (D) 58

26. 2, 5, 4, 10, 7, 15, 11, 20, ?, ?

(NTSE Stage-II, 2009)

(A) 12, 21 (B) 16, 25

(C) 13, 25 (D) 17, 30

27. 57, 54, 58, 55, 59, 56, 60, ?

(NTSE Stage-II, 2011)

(A) 64 (B) 63 (C) 58 (D) 57

28. 27, 31, 40, 56, 81, 117, ?

(NTSE Stage-II, 2011)

(A) 156 (B) 165

(C) 166 (D) 169

29. 55, 168, 57, 120, 60, 80, 62, 48, 65, 24, ?, ?

(NTSE Stage-II, 2011)

(A) 69, 11 (B) 67, 8

(C) 8, 71 (D) 6, 72

30. 0, 2, 24, 252,?

(NTSE Stage-II/Raj.//2013)

(A) 620 (B) 1040

(C) 3120 (D) 5430

31. 2, 10, 26, ?, 242

(NTSE Stage-II/Raj.//2013)

(A) 80 (B) 81 (C) 82 (D) 84

32. 445, 221, 109, 53, 25, 11, ?

(NTSE Stage-I/Haryana/2013)

(A) 2 (B) 4 (C) 6 (D) 8

33. 6, 15, 35, 77, 143, ?

(NTSE Stage-I/Haryana/2013)

(A) 171 (B) 181

(C) 191 (D) 221

34. 1, 2, 2, 4, 16, ?, 65536

(NTSE Stage-I/Haryana/2013)

(A) 276 (B) 256

(C) 198 (D) 64

35. ?, 17, 33, 51, 75

(NTSE Stage-I/MH./2013)

(A) 9 (B) 13 (C) 8 (D) 11

36. 14, 17, 24, 35, ?

(NTSE Stage-I/MH./2013)

(A) 49 (B) 38

(C) 50 (D) 46

37. 37, 57, 81, 99, ?

(NTSE Stage-I/MH./2013)

(A) 118 (B) 119 (C) 135 (D) 137

38. 25, 30, 36, 44, ?

(NTSE Stage-I/MH./2013)

(A) 50 (B) 43 (C) 51 (D) 47

39. 12, 22, 69, 272, 1365, ?

(NTSE Stage-I/Chandigr./2014)

(A) 8196 (B) 8184

(C) 8195 (D) 6830

40. 729, 81, 9, 1, $\frac{1}{9}$, ?, $\frac{1}{729}$

(NTSE Stage-I/Rajasthan/2016)

(A) $\frac{1}{27}$ (B) $\frac{1}{81}$ (C) $\frac{1}{243}$ (D) $\frac{1}{486}$

41. 2, 17, 52, ?, 206

(NTSE Stage-II, 2015)

(A) 73 (B) 85 (C) 113 (D) 184

42. 3, 6, 24, 30, 63, 72, ?, ?, 195, 210

(NTSE Stage-II, 2015)

(A) 117, 123 (B) 120, 132

(C) 123, 135 (D) 135, 144

43. 121,144, 169, ?, 225, 256.

(NTSE Stage-I/Raj./2017)

(A) 196 (B) 296

(C) 220 (D) 222

44. 5, 10, 20. ?, 80.
(NTSE Stage-I/Raj./2017)
(A) 35 (B) 40 (C) 45 (D) 50

45. 4, 8, 9, 27, 16, ?, 25, 125.
(NTSE Stage -I/Raj./2017)
(A) 8 (B) 16 (C) 25 (D) 64

46. 2, 3, 5, 8, ?, 17.
(NTSE Stage-I/Raj./2017)
(A) 6 (B) 12 (C) 13 (D) 15

47. 4,9,25,?, 121, 169.
(NTSE Stage-I/Raj .2018)
(A) 36 (B) 49 (C) 64 (D) 81

48. 1, 3, 7, 13, 21, ?, 43, 57.
(NTSE Stage-I/Raj./2018)
(A) 31 (B) 29 (C) 30 (D) 32

49. 5, 3, 10, 8, 17, 15, ? , 24
(NTSE Stage-I/Raj .2018)
(A) 25 (B) 23 (C) 26 (D) 27

50. 97, 77, 59, ?, 29, 17.
(NTSE Stage-I/Raj./2018)
(A) 34 (B) 39 (C) 37 (D) 43

51. 5, 16, 51, 158, ? .
(NTSE Stage- I/Raj./ 2019)
(A) 1452 (B) 483 (C) 481 (D) 1454

52. 198, 194, 185, 169, ? .
(NTSE Stage- I/Raj./ 2019)
(A) 92 (B) 136 (C) 144 (D) 112

53. 11, 29, 55, ? , 131.
(NTSE Stage- I/Raj./ 2019)
(A) 110 (B) 81 (C) 89 (D) 78

54. 589654237, 89654237, 8965423, 965423, ? .
(NTSE Stage- I/Raj./ 2019)
(A) 58965 (B) 65423
(C) 89654 (D) 96542

55. 1, 1, 4, 8, 9, 27, 16, ? .
(NTSE Stage- I/Raj./ 2019)
(A) 32 (B) 64 (C) 81 (D) 256

56. 4, 9, 25, ?, 121, 169, 289, 361.
(NTSE Stage- I/Raj./ 2019)
(A) 49 (B) 64 (C) 81 (D) 87

57. 980, 392, 156.8, ?, 25.088, 10.0352.
(NTSE Stage- I/Raj./ 2019)
(A) 65.04 (B) 60.28
(C) 62.72 (D) 63.85

58. 3, 10, 101, ? .
(NTSE Stage- I/Raj./ 2019)
(A) 10101 (B) 10201
(C) 10202 (D)11012

EXERCISE – II

Directions (1 – 36): Find the wrong number of the series:

1. 696, 340, 168, 80, 36, 14, 3
   (A) 168 (B) 36 (C) 696 (D) 340
2. 8, 14, 26, 48, 98, 194, 386
   (A) 14 (B) 48 (C) 98 (D) 194
3. 10, 26, 74, 218, 654, 1946, 5834
   (A) 26 (B) 74 (C) 218 (D) 654
4. 2, 6, 24, 96, 285, 568, 567
   (A) 6 (B) 24 (C) 285 (D) 567
5. 2, 3, 4, 4, 6, 8, 9, 12, 16
   (A) 3 (B) 6 (C) 9 (D) 12
6. 4, 26, 163, 1149, 9201, 82809
   (A) 26 (B) 163 (C) 82809 (D) 9201
7. 0, 8, 7, 16, 14, 24, 22, 32
   (A) 22 (B) 14 (C) 24 (D) 32
8. 1, 11, 22, 34, 47, 61, 76, 93
   (A) 93 (B) 1 (C) 34 (D) 76
9. 438, 487, 447, 476, 460, 469
   (A) 447 (B) 438
   (C) 476 (D) 469
10. 3, 7, 9, 21, 27, 66, 81, 189, 243
    (NTSE Stage-I/Raj./ 2007)
    (A) 27 (B) 66 (C) 243 (D) 21
11. 27, 34, 40, 45, 49, 53, 54, 55
    (NTSE Stage-I/Raj./ 2007)
    (A) 53 (B) 45 (C) 56 (D) 34
12. 0, 2, 3, 6, 6, 20, 9, 54, 12
    (NTSE Stage-I/Raj./ 2007)
    (A) 3 (B) 6 (C) 20 (D) 54
13. 0, 2, 10, 36, 68, 130
    (NTSE Stage-I/Raj./ 2007)
    (A) 10 (B) 36 (C) 68 (D) 130
14. 9, 54, 44, 264, 254, 1520, 1514
    (NTSE Stage-I/Raj./ 2007)
    (A) 1514 (B) 1520
    (C) 264 (D) 44
15. 10, 15, 26, 35, 48, 63, 82
    (NTSE Stage-I/Raj./ 2008)
    (A) 48 (B) 26 (C) 63 (D) 82
16. 3, 10, 30, 66, 127, 218
    (NTSE Stage-I/Raj./ 2008)
    (A) 3 (B) 66
    (C) 30 (D) 218
17. 7, 9, 17, 42, 91, 172, 293
    (NTSE Stage-I/Raj./ 2008)
    (A) 91 (B) 42
    (C) 17 (D) 9
18. 2, 12, 24, 34, 68, 78, 158, 166
    (NTSE Stage-I/Raj./ 2008)
    (A) 68 (B) 78 (C) 158 (D) 166
19. 2, 6, 10, 20, 30, 42, 56
    (NTSE Stage-I/Raj./ 2008)
    (A) 6 (B) 10 (C) 20 (D) 30
20. 7, 9, 16, 25, 41, 68, 107, 173
    (NTSE Stage-II, 2008)
    (A) 16 (B) 41 (C) 68 (D) 107
21. 3, 9, 27, 82, 243
    (NTSE Stage-I/Raj./ 2009)
    (A) 27 (B) 54
    (C) 82 (D) 162
22. 5, 9, 17, 35, 65, 129
    (NTSE Stage-I/Raj./ 2009)
    (A) 65 (B) 35
    (C) 17 (D) 9

23. 1, 5, 6, 11, 17, 27, 45, 73
(NTSE Stage-I/Raj./ 2009)
(A) 27 (B) 45
(C) 17 (D) 11

24. 3, 6, 11, 18, 28, 38, 51, 66
(NTSE Stage-I/Raj./ 2009)
(A) 18 (B) 28 (C) 38 (D) 51

25. 320, 254, 200, 155, 122, 100, 89
(NTSE Stage-I/Raj./ 2009)
(A) 155 (B) 320
(C) 254 (D) 200

26. 6, 8, 9, 12, 14, 18, 22, 26, 30
(NTSE Stage-I/Raj./ 2012)
(A) 12 (B) 22
(C) 26 (D) 30

27. 3, 7, 9, 28, 27, 84, 81, 448, 243
(NTSE Stage-I/Raj./ 2012)
(A) 84 (B) 81 (C) 28 (D) 7

28. 190, 94, 46, 22, 10, 3
(NTSE Stage-I/Raj./ 2012)
(A) 94 (B) 46
(C) 22 (D) 3

29. 0, 5, 15, 50, 128
(NTSE Stage-I/Raj./ 2012)
(A) 5 (B) 15
(C) 50 (D) 128

30. 9, 63, 5, 35, 1, 8
(NTSE Stage-I/Raj./ 2012)
(A) 63 (B) 5 (C) 35 (D) 8

31. 89, 78, 86, 80, 85, 82, 83
(NTSE Stage-I/Raj./ 2013)
(A) 83 (B) 82
(C) 86 (D) 78

32. 1, 1, 3, 9, 6, 36, 10, 100, 16, 225
(NTSE Stage-I/Raj./ 2013)
(A) 225 (B) 16
(C) 10 (D) 9

33. 444, 300, 200, 136, 87, 84, 80
(NTSE Stage-I/Raj./ 2013)
(A) 300 (B) 200
(C) 136 (D) 87

34. 8, 15, 31, 61, 123, 247, 491
(NTSE Stage-I/Raj./ 2013)
(A) 247 (B) 491
(C) 121 (D) 61

35. 3, 6, 24, 30, 63, 72, 122, 132
(NTSE Stage-I/Raj./ 2013)
(A) 132 (B) 30
(C) 122 (D) 72

36. 15, 34, 71, 134, 223, 350
(NTSE Stage-I/Kar./ 2013)
(A) 71 (B) 134
(C) 223 (D) 350

Directions (37– 42) : In each of the following questions, a number series is given. After the series, below it in the next line, a number is given followed by (P), (Q), (R), (S) and (T). You have to complete the series starting with the number given following the sequence of the given series. Then answer the question given below it.

37. 80 50 130 100 180 150 230
900 (P) (Q) (R) (S) (T)
Which number will come in place fo (R) ?
(A) 1050 (B) 920
(C) 1000 (D) 950

38. 25 194 73 154 105
14 (P) (Q) (R) (S) (T)
Which number will come in place of (T) ?
(A) 120 (B) 116
(C) 119 (D) 202

39. 3 4 10 33 136
7 (P) (Q) (R) (S) (T)
Which number will come in place of (T) ?
(A) 1160 (B) 920
(C) 1165 (D) 840

40. 2 3 8 27
5 (P) (Q) (R) (S) (T)
Which of the following will come in place of (T) ?
(A) 184 (B) 6
(C) 925 (D) 45

41. 5 18 48 112
7 (P) (Q) (R) (S) (T)
Which number will come in place of (S) ?
(A) 172 (B) 276
(C) 270 (D) 376

42. 15 159 259 323
7 (P) (Q) (R) (S) (T)
Which of the following numbers will come in place of (R) ?
(A) 251 (B) 315
(C) 176 (D) 151

Space for Notes :

EXERCISE – III

Directions (1 – 10): Find the wrong term:

1. ABC, BCD, CDE, DEF, FEG
   (A) BCD (B) CDE
   (C) DEF (D) FEG
2. ZOA, XMF, VKK, THP, RGU, PEZ
   (A) THP (B) XMF
   (C) VKK (D) RGU
3. AACC, BBED, CCHE, DDMF, EEQG
   (A) AACC (B) DDMF
   (C) BBED (D) EEQG
4. ECA, JHF, OMK, TQP, YWU
   (A) ECA (B) JHF
   (C) TQP (D) YWU
5. DKY, FJE, HIT, JHS, LGO
   (A) FJW (B) LGQ
   (C) JHJ (D) HIT
6. DVG, FSI, HPK, JNM, LJO
   (A) DVG (B) JNM
   (C) HPK (D) LJO
7. ABD, DGK, HMS, NTB, SBL, ZKW
   (A) NTB (B) DGK
   (C) SBL (D) ZKW
8. EPV, FQW, GRX, HTY, ITZ
   (A) FQW (B) GRX
   (C) HTY (D) ITZ
9. PON, RQP, TSR, VVT, XWV, ZYX
   (A) VVT (B) TSR
   (C) XWV (D) RQP
10. P 3 C, R 5 F, T 8 I, V 12 L, X 18 O, Z 23 R
    (A) V 12 L (B) X 18 O
    (C) Z 23 R (D) R 5 F

Directions (11 – 62) : Find the Missing term:

11. D–4, F–6, H–8, J–10, ?, ?
    (A) K–12, M–13 (B) L–12, M–14
    (C) L–12, N–14 (D) K–12, M–14
12. 2B, 4C, 8E, 14H, ?
    (A) 16 K (B) 20 I
    (C) 20 L (D) 22 L
13. 3F, 6G, 11I, 18L, ?
    (A) 21 O (B) 25 N
    (C) 25 P (D) 27 P
14. W–144, ?, S–100, Q–81, O–64
    (A) U–121 (B) U–122
    (C) V–121 (D) V–128
15. 2, A, 9, B, 6, C, 13, D, ?
    (A) 9 (B) 10
    (C) 12 (D) 19
16. KM5, IP8, GS11, EV14, ?
    (A) BX17 (B) BY17
    (C) CY17 (D) CY18
17. C4X, F9U, I16R, ?
    (A) K25P (B) L25P
    (C) L25O (D) L27P
18. 2Z5, 7Y7, 14X9, 23W11, 34V13, ?
    (A) 27U24 (B) 45U15
    (C) 47U15 (D) 47V14
19. Q1F, S2E, U6D, W21C, ?
    (A) Y44B (B) Y66B
    (C) Y88B (D) Z88B
20. B, E, H, ?
    (A) K (B) L (C) M (D) J
21. Y, W, U, S, Q, ?
    (A) A (B) P (C) O (D) B

22. AH, DL, GP, JT, ?
(A) MY (B) NX
(C) MX (D) NY

23. LO, IL, FI, CF, ?
(A) ZB (B) AB
(C) ZC (D) ZO

24. ZYX, BAZ, DCB, FED, ?
(A) GHF (B) FGH
(C) FFG (D) HGF

25. ATL, BUM, CVN, DWO, ?
(A) EZP (B) EYQ
(C) EFP (D) EXP

26. TYU, NSO, HMI, ?
(A) AGC (B) CGC
(C) GBC (D) BGC

27. MAAL, AALM, ALMA, LMAA, ?
(A) AMLA (B) MAAL
(C) AAML (D) LAAM

28. A3P, C5N, E8K, G12G, ?
(A) I16D (B) I17B
(C) I17D (D) J16B

29. AAZY, DDVU, GGRQ, ?, MMJI, PPFE
(NTSE Stage-II, 2008)
(A) KKMN (B) MMJN
(C) KKMM (D) JJNM

30. ZDOA, VHNF, ?, NPLP, JTKU, FXJZ
(NTSE Stage-II, 2008)
(A) RLKM (B) MLRK
(C) RKML (D) RLMK

31. ZOA, XMF, ?, TIP, RGU, PEZ
(NTSE Stage-II, 2008)
(A) YXX (B) WLL
(C) UKK (D) VKK

32. ABHR, EFIO, IJJL, MNKI, ?, UVMC
(NTSE Stage-II, 2009)
(A) QRLM (B) QRST
(C) QULM (D) QRLF

33. BDF, HKN, QUY, ?, RXD
(NTSE Stage-II, 2009)
(A) CHM (B) BGL (C) CIO (D) BHN

34. AZYB, CXVE, FURI, ?
(NTSE Stage-II, 2009)
(A) KQPL (B) JRNM
(C) JQMN (D) ISPM

35. YANWY, DFMBD, IKNGI, NPMLN, (?), XZMVX
(NTSE Stage-I/Raj./ 2013)
(A) RUMSR (B) SUNQS
(C) UWNSU (D) VUMTV

36. PEXKW, RFWMU, TGVOS, VHUQQ, XITSO, (?)
(NTSE Stage-I/Raj./ 2013)
(A) ZJSUM (B) YJSUZ
(C) ZKSVJ (D) JZSTN

37. AYBZC, DWEXF, GUHVI, JSKTL, (?), POQPR
(NTSE Stage-I/Raj./ 2013)
(A) MQDRN (B) QMONR
(C) MQNRO (D) NQMOR

38. ZYYZR, ABVUN, (?), BCUTM, XWABT, CDTSL
(NTSE Stage-I/Raj./ 2013)
(A) YXZAS (B) ZYABT
(C) XWYZR (D) YXZAB

39. deb, ijg, nol, (?), xyv
(NTSE Stage-I/Raj./ 2013)
(A) rsp (B) stp (C) rsq (D) stq

40. BEG, DGI, FIK, HKM, (?)

(NTSE Stage-I/Raj./ 2014)

(A) JMO (B) KMO

(C) JML (D) JNP

41. KEM, IDL, GCK, (?), CAI

(NTSE Stage-I/Raj./ 2014)

(A) ECJ (B) EBK

(C) FBJ (D) EBJ

42. JCME, LDOG, NEQI, (?)

(NTSE Stage-I/Raj./ 2014)

(A) PFSJ (B) PESI

(C) PESK (D) PFSK

43. FOX, IQV, LST, OUR ?

(NTSE Stage-I/Raj./ 2015)

(A) RPW (B) RWP

(C) QVS (D) SXU

44. qpo, nml, ?

(NTSE Stage-I/Raj./ 2015)

(A) ghf (B) ijk

(C) kji (D) hgi

45. MYZ, LWX, ?, JST

(NTSE Stage-I/Raj./ 2016)

(A) KUV (B) IQR

(C) HOP (D) GMN

46. bdf, hil_____, tvx

(NTSE Stage-I/Raj./ 2016)

(A) nrp (B) pnr

(C) nqr (D) npr

47. A, D, G, J, ?

(NTSE Stage- I/Raj. 2017)

(A) I (B) M

(C) X (D) None

48. LO, JQ, HS, __?__ .

(NTSE Stage- I/Raj. 2017)

(A) FU (B) FQ

(C) EV (D) DW

49. A, C, F, J, O, , __?__ .

(NTSE Stage- I/Raj. 2017)

(A) P (B) T (C) S (D) U

50. ZXV, TRP, NLJ, __?__ .

(NTSE Stage- I/Raj. 2017)

(A) HEF (B) HFD

(C) EFH (D) IGE

51. G, K, O, S, __?__ .

(NTSE Stage- I/Raj. 2018)

(A) U (B) W

(C) V (D) X

52. DX, HT, KQ, OM, __?__ .

(NTSE Stage- I/Raj. 2018)

(A) SJ (B) RK (C) QJ (D) RJ

53. H, D, A, Y, X,__?__ .

(NTSE Stage- I/Raj. 2018)

(A) X (B) W (C) T (D) V

54. KLE, IND, GPC, __?__ , CTA.

(NTSE Stage- I/Raj. 2018)

(A) DRB (B) BSE

(C) ERB (D) ECR

55. B, D, F, I, L, P, ?

(NTSE Stage- I/Raj. 2019)

(A) R (B) S

(C) T (D) U

56. GH, JL, N Q, SW, YD, ?

(NTSE Stage- I/Raj. 2019)

(A) EJ (B) FJ

(C) EL (D) FL

57. Z, U, Q, ? , L

(NTSE Stage- I/Raj. 2019)

(A) I (B) K

(C) M (D) N

58. AZ, GT, MN, ? , YB

(NTSE Stage- I/Raj. 2019)

(A) JH (B) SH

(C) SK (D) TS

59. ABD, DGK, HMS, MTB, SBL, ?

(NTSE Stage- I/Raj. 2019)

(A) XKW (B) ZAB

(C) ZKU (D) ZKW

60. PBA, QDC, RFE, ?

(NTSE Stage- I/Raj. 2019)

(A) SHG (B) OAB

(C) TJI (D) ULK

61. PERPENDICULAR, ERPENDICULA, RPENDICUL, ?

(NTSE Stage- I/Raj. 2019)

(A) PENDICULAR (B) PENDIC

(C) ENDIC (D) PENDICU

62. ST, ND, RD, TH, __?

(NTSE Stage- I/Raj. 2019)

(A) TH (B) VW

(C) RW (D) ST

Space for Notes :

EXERCISE – IV

Directions (1 – 34) : Which sequence of letters when placed at the blanks one after the other will complete the given letter series ?

1. _ a a b b _ a b b a _ b
(A) b a b (B) a b a (C) b b a (D) b a a

2. a _ b a a _ b a a _ b a
(A) a a b (B) b a b (C) b b a (D) b b b

3. _ b a a _ b a _ a a b _
(A) b a b a (B) b b a a
(C) a b b b (D) b b a b

4. b a b b b _ b _ b _ b b
(A) b b a (B) b a a (C) a b a (D) a a a

5. _ ha _ hach _ c _ _
(A) ccaha (B) achac (C) chaaa (D) aaach

6. m _ i _ mi _ m _ iim
(A) immm (B) imim (C) immi (D) miim

7. a _ b b _ caab _ ccaa _ bcc
(NTSE Stage-I/Raj./ 2007)
(A) bacb (B) acbb (C) caba (D) abba

8. ab _ aa _ bbb _ aaa _ bbba
(NTSE Stage-I/Raj./ 2007)
(A) baab (B) abab (C) aaab (D) abba

9. abca _ bcaab _ aa _ caa _ c
(NTSE Stage-I/Raj./ 2007)
(A) abac (B) abba (C) acbb (D) ccaa

10. abb _ baa _ a bab _ aba
(NTSE Stage-I/Raj./ 2007)
(A) ccac (B) abab (C) aabb (D) abba

11. bc _ b _ c _ b _ ccb
(NTSE Stage-I/Raj./ 2007)
(A) cbcb (B) cbbc
(C) bbcb (D) bcbc

12. ab _ ab _ ababb _ b _ ab
(NTSE Stage-I/Raj./ 2008)
(A) baaa (B) abbb (C) aaab (D) baab

13. mq _ sqm _ qssq _ m _ ssqmm _ s
(NTSE Stage-I/Raj./ 2008)
(A) qsmsq (B) qmsmq
(C) smmqq (D) sqmss

14. aa _ bb _ aa _ abbbb _ a
(NTSE Stage-I/Raj./ 2008)
(A) abab (B) baba (C) aabb (D) bbaa

15. aaa _ bb _ aab _ baaa _ bb
(NTSE Stage-I/Raj./ 2008)
(A) bbaa (B) babb (C) baab (D) abab

16. a b a _ a _ a b a _ a b a _ a b
(NTSE Stage-II, 2008)
(A) a a a a (B) b b b b
(C) a b a a (D) b a b a

17. _ i m n o k _ m n o k i _ n o k l m _ o
(NTSE Stage-II, 2008)
(A) i k i m (B) i i m m
(C) k i m n (D) m i m n

18. k _ k k i i i _ m m _ m _ n _ n
(NTSE Stage-II, 2008)
(A) i k n m n (B) i k m n n
(C) i i m m n (D) k l m n n

19. bc _ b _ c _ b _ ccb
(NTSE Stage-I/Raj./ 2009)
(A) cbcb (B) bbcb (C) cbbc (D) bcbc

20. ab _ baa _ cb _ ab _ ba
(NTSE Stage-I/Raj./ 2009)
(A) cacb (B) bacb
(C) cbac (D) abcb

21. ab _ ba _ abab _ _

(NTSE Stage-I/Raj./ 2009)

(A) aaaa (B) babb (C) aaba (D) aaab

22. _ bc _ _ bb _ aabc

(NTSE Stage-I/Raj./ 2009)

(A) acac (B) babc (C) abab (D) aacc

23. ab _ bca _ a _ a _ c

(NTSE Stage-I/Raj./ 2009)

(A) abba (B) ccbb (C) bacb (D) abcc

24. B_N_ZF_HNT_FBH_TZ_

(NTSE Stage-II, 2009)

(A) H B T Z N F (B) H T B F N Z

(C) T B Z H N F (D) H T B Z N F

25. U_T_K_P_CKUP_CK

(NTSE Stage-II, 2009)

(A) T C P T U (B) C T P U T

(C) P C U T T (D) P U T C T

26. J_HL_K_IH_LKJI_LLK

(NTSE Stage-II, 2009)

(A) H I L J L (B) I L J L H

(C) L J L H I (D) J L H I L

27. _ ab _ a _ bb _ ab _ a _

(NTSE Stage-I/Raj./ 2012)

(A) abaaba (B) babbba

(C) aabbab (D) bbaabb

28. _ _ a bb _ bba _ bab _ a _

(NTSE Stage-I/Raj./ 2012)

(A) abaaba (B) aabbaa

(C) bbabbb (D) bbaabb

29. _ ac _ ca _ aca _ a _ a _

(NTSE Stage-I/Raj./ 2012)

(A) cacaca (B) aaaccc

(C) acacac (D) cacccc

30. ab _ acc _ _ da _ bba _

(NTSE Stage-I/Raj./ 2013)

(A) cdabc (B) badaa

(C) cdbcd (D) dbacd

31. abb _ _ ab _ b _ bba _ a

(NTSE Stage-I/Raj./ 2013)

(A) bbbab (B) babba

(C) abaab (D) bbabb

32. b _ a _ bab _ ab _ a

(NTSE Stage-I/Raj./ 2013)

(A) baba (B) babb

(C) abab (D) abba

33. $\alpha\beta\_\alpha\alpha\_\beta\beta\beta\_\alpha\alpha\alpha\alpha\_\beta\beta\beta$

(NTSE Stage-II/2013)

(A) $\alpha\beta\beta\alpha$ (B) $\beta\alpha\beta\alpha$

(C) $\alpha\alpha\alpha\beta$ (D) $\alpha\beta\alpha\beta$

34. ca _ cab _ ab _ _ bc _

(NTSE Stage-I/Raj./2014)

(A) bccaa (B) accab

(C) bacaa (D) abaca

Directions (35–36) : The series given below are based on the letter series, In each of these series, some letters are missing. Select the correct alternative. If more than five letters are missing, select the last five letter of the series.

35. abcd _ bc _ e _ _ de _ _ _ _ _ _ _

(A) deabc (B) edcba

(C) decba (D) edabc

36. _ _ r _ tqrptsrpqst _ _ _ _ _

(A) pqrts (B) pqtrs

(C) pqrst (D) qrpst

Directions (37 – 38) : There is a letter series in the first row and a number series in the second row. Each number in the number series stands for a letter in the letter series. Since in each of that series some term are missing you have to find out as to what those terms are, and answer the questions based on these as given below in the series.

37. n _ g f _ t _ f h t n _ _ t _ b _ f
1 3 _ 2 4 5 0 _ 4 _ _ 3 _ _ _ _ _ _

The last five terms of the number series are

(A) 50123

(B) 40321

(C) 40231

(D) 51302

38. _ m y e _ _ y i x _ y i m _ _ i _ _ _ _
4 6 _ 5 8 6 _ _ _ 5 7 _ 6 5 8 _ _ _ _ _

The last five terms of the number series are

(A) 46758

(B) 74658

(C) 76485

(D) 46785

Directions (39–41) : In each of the following questions, three sequences of letter/numbers are given which correspond to each other in some way. In each question, you have to find out the letter/ numerals that come in the vacant places marked by (?). These are given as one of the four alternatives under the question. Mark your answer as instructed.

39. _ A C _ B D _ C D C D
2 _ 4 1 _ 1 4 _ _ _ _
r s _ q r _ p ? ? ? ?

(A) p q p q (B) p r p r

(C) r q r q (D) r s r s

40. A _ B A C _ D _ B C D C
_ 4 _ 3 _ 2 _ 5 ? ? ? ?
d c _ _ b a c b _ _ _ _

(A) 2 4 5 4 (B) 2 5 4 5

(C) 3 4 5 4 (D) 4 5 2 5

41. _ A D A C B _ _ B D C C
2 4 _ _ 2 3 5 3 _ _ _ _
p _ _ q _ _ r s ? ? ? ?

(A) p r s s (B) p s r r

(C) r p s s (D) s r p p

Answer Key

EXERCISE–I

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
C	B	D	D	D	C	D	D	D	A	D	A	D	D	D
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
A	A	C	A	C	C	D	B	B	C	B	D	C	B	C
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
C	B	D	B	B	C	C	C	B	B	C	B	A	B	D
46	47	48	49	50	51	52	53	54	55	56	57	58		
B	B	A	C	D	C	C	C	D	B	A	C	C		

EXERCISE–II

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
D	B	D	B	C	C	A	A	A	B	A	C	B	B	A
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
C	D	C	B	C	C	B	A	B	D	B	A	D	D	D
31	32	33	34	35	36	37	38	39	40	41	42			
C	B	D	A	C	B	B	C	C	C	B	B			

EXERCISE–III

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
D	A	B	C	D	B	A	C	A	B	C	D	D	A	B
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
C	C	C	C	A	C	C	C	D	D	D	B	B	D	D
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
D	D	A	C	B	A	C	A	D	A	D	D	B	C	A
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
D	B	A	D	B	B	D	A	C	C	D	D	B	D	A
61	62													
D	A													

EXERCISE–IV

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
D	D	C	C	A	B	B	A	C	D	A	A	C	D	B
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
B	C	D	A	C	A	A	B	D	C	B	A	C	D	B
31	32	33	34	35	36	37	38	39	40	41				
A	C	B	A	A	A	D	D	A	B	D				

SELF PROGRESS ASSESSMENT FRAMEWORK

(CHAPTER : VERBAL SERIES)

CONTENT	STATUS	DATE OF COMPLETION	SELF SIGNATURE
Theory			
In-Text Examples			
Solved Examples			
Exercise I			
Exercise II			
Exercise III			
Exercise IV			
Short Note-1			
Revision - 1			
Revision - 2			
Revision - 3			
Remark			

NOTES :

1. In the status, put "completed" only when you have thoroughly worked through this particular section.
2. Always remember to put down the date of completion correctly. It will help you in future at the time of revision.

Space for Notes :

NON-VERBAL : SERIES 2

INTRODUCTION

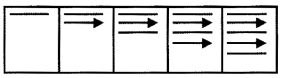
This section deals with the problems based upon the continuation of figures. There are various types of problems on series. However, the fundamental concept for each type is the same. There is a sequence of figures depicting a change step by step. Either one of these figures is out of order and has to be omitted or figure has to be selected from a separate set of figures, which would continue the series.

1. FIVE FIGURE SERIES

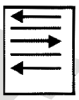
This type of problems on series consist of five figures numbered 1, 2, 3, 4 and 5 forming the problem set, followed by four other figures numbered A, B, C and D forming the Answer Set. The five consecutive problem figures form a definite sequence and it is required to choose one of the figures from the answer set which will containue the same sequence.

Example 1

In the following example find the figure from the answer set (i.e. figs. A, B, C and D) which will continue the series given in the problem set (i.e. figs. 1, 2, 3, 4 and 5).



(1) (2) (3) (4) (5)

(A)  (B)  (C)  (D) 

Solution :

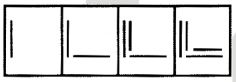
Clearly, arrows and straight lines are added alternately to get subsequent figures. Also all the arrows point towards the right. Hence, the answer is (D).

2. FOUR FIGURE SERIES

This type of questions are largely similar to those discussed in Type-1; the only difference being that in this case the series or the sequence is indicated by four problem figures and it is required to select a figure from amongst the answer figure, which would be fifth figure to continue the series.

Example 2

In the following example find figure from the Answer set (A, B, C and D) which would continue the series indicated by the four figures of the problem set (1, 2, 3 and 4).



(1) (2) (3) (4)

(A)  (B)  (C)  (D) 

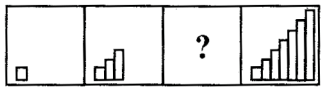
Solution :

Clearly, vertical and horizontal lines are added alternately and in a set order. To continue this series, fig (C) should follow fig. (4). Hence, the answer is (C).

3. CHOOSING THE MISSING FIGURE IN A SERIES

In this type of questions, you are given a set of four figures (labelled 1, 2, 3 and 4) following a certain sequence and hence forming a series. However, the figure at 3 is missing. The candidate is required to choose this figure from the alternatives A, B, C and D.

Example 3



(1) (2) (3) (4)

(A)  (B)  (C)  (D) 

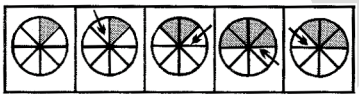
Solution :

Clearly, two rectangles are added to the figure in each step so as to from stairs. There should be five rectangles in fig. (3) so fig. (A) is the answer. Hence, the answer is (A).

4. DETECTING THE INCORRECT ORDER IN A SERIES

The fourth type of questions on series constants of an un-numbered figure followed by four other figures numbered as A, B, C and D. All the five figures together form a series. The un-numbered figure marks the beginning of the series and so its position is fixed. However, she series will be established the earlier of the two figures is the answer.

Example 4



(A) (B) (C) (D)

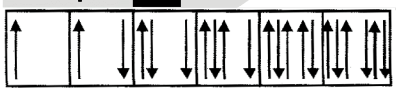
Solution :

Clearly, in one step an arrow occurs adjacent to a shaded portion of the circle and in the subsequent step, that portion also gets shaded and the arrow is displaced on the other side of the shaded portions. This series will be complete if figures (C) and (D) are interchanged. Hence, the answer is (C).

5. DETECTING THE WRONG FIGURE IN A SERIES

This type of questions begin with an un-numbered figure followed by four figures numbered from A to D and then again an un-numbered figure on the extreme right. These six figure together form a series which starts at the first (un-numbered) figure and ends at the last (un-numbered) figure. However, one and only one of these figures does not fit into the series. The number of that figure is the answer.

Example 5



(A) (B) (C) (D)

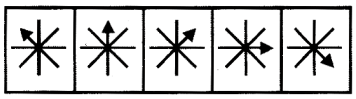
Solution :

In the above set of figures, the arrows are added to the right and left sides alternately. But in the third figure the arrow which was to be added to ther right. Hence, the answer is (C).

SOLVED EXAMPLES

SE. 1

In the following example find the figure from the answer set (i.e. figs. A, B, C and D) which will continue the series given in the problem set (i.e. figs. 1, 2, 3, 4 and 5).



(1) (2) (3) (4) (5)

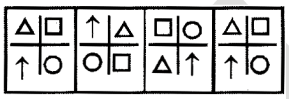
(A)  (B) 

(C)  (D) 

Ans. Here, the arrow rotates one step clockwise in every subsequent figure. Hence, the answer is (B).

SE. 2

In the following example find figure from the Answer set (A, B, C and D) which would continue the series indicated by the four figures of the problem set (1, 2, 3 and 4).



(1) (2) (3) (4)

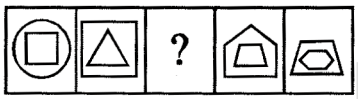
(A)  (B) 

(C)  (D) 

Ans. Clearly in one step, the symbols move one step CW and in the next step, the symbols at the vertically opposite positions interchange positions. Hence, the answer is (A).

SE. 3

In this type of question, you are given a set of four figures (labelled 1, 2, 3 and 4) following a certain sequence and hence forming a series. However, the figure at 3 is missing. The candidate is required to choose this figure from the alternatives A, B, C and D.



(1) (2) (3) (4) (5)

(A)  (B) 

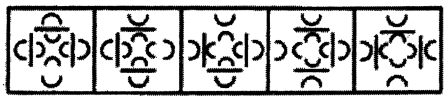
(C)  (D) 

Ans. Clearly, the inner small figure become the outer large figure and a new small figure appears inside it in every step. Hence, the answer is (C).

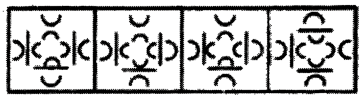
MULTIPLE CHOICE QUESTIONS

Directions (1–35) : Each of the following questions consists of five problem figure. These problem figures form a series. Find out the one figure from the answer figures that will continue the series.

1. Problem figures



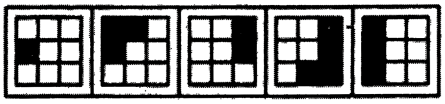
Answer Figures



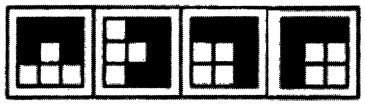
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

2. Problem figures



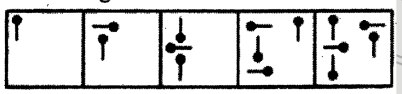
Answer Figures



1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

3. Problem figures

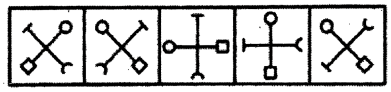


Answer Figures

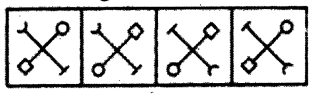
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

4. Problem figures



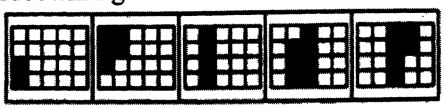
Answer Figures



1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

5. Problem figures

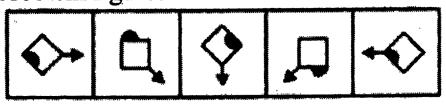


Answer Figures

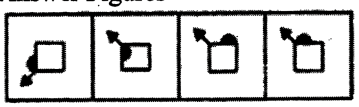
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

6. Problem figures



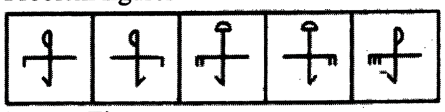
Answer Figures



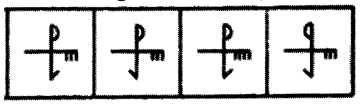
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

7. Problem figures



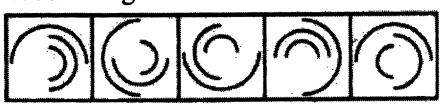
Answer Figures



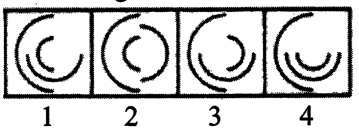
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

8. Problem figures



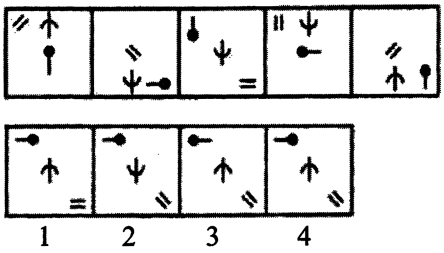
Answer Figures



1 2 3 4

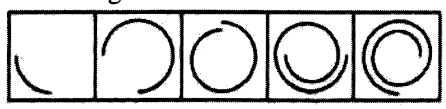
(A) 1 (B) 2 (C) 3 (D) 4

9.

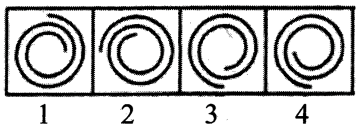


(A) 1 (B) 2 (C) 3 (D) 4

10. Problem figures

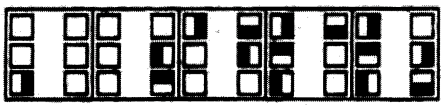


Answer Figures

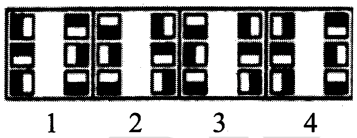


(A) 1 (B) 2 (C) 3 (D) 4

11. Problem figures



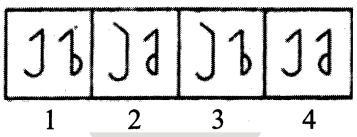
Answer Figures



(A) 1 (B) 2 (C) 3 (D) 4

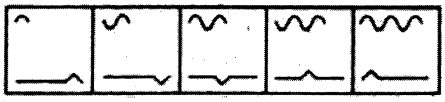
12. Problem figures

Answer Figures

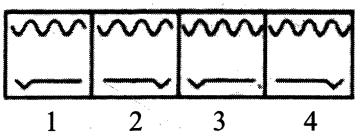


(A) 1 (B) 2 (C) 3 (D) 4

13. Problem figures

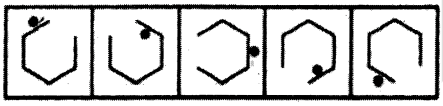


Answer Figures

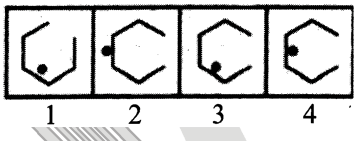


(A) 1 (B) 2 (C) 3 (D) 4

14. Problem figures

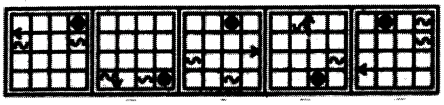


Answer Figures

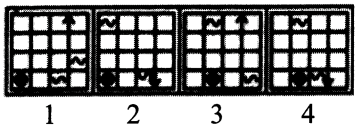


(A) 1 (B) 2 (C) 3 (D) 4

15. Problem figures



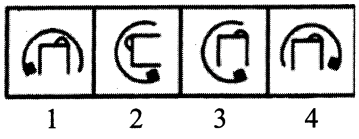
Answer Figures



(A) 1 (B) 2 (C) 3 (D) 4

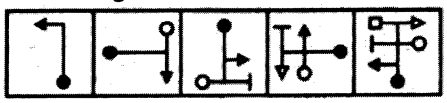
16. Problem figures

Answer Figures

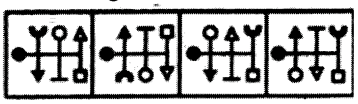


(A) 1 (B) 2 (C) 3 (D) 4

17. Problem figures



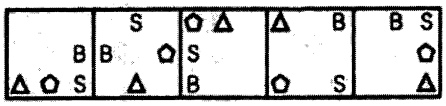
Answer Figures



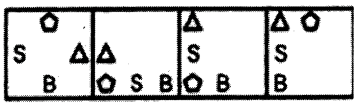
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

18. Problem figures



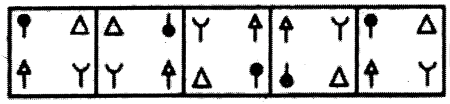
Answer Figures



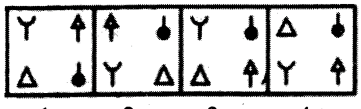
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

19. Problem figures



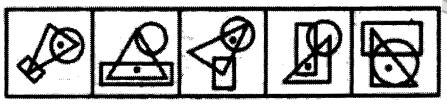
Answer Figures



1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

20. Problem figures

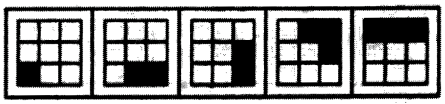


Answer Figures

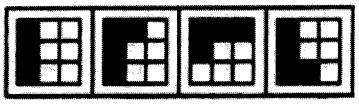
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

21. Problem figures



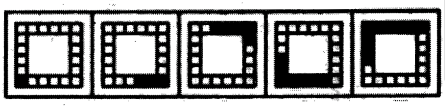
Answer Figures



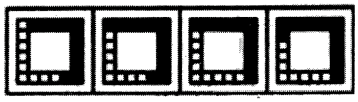
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

22. Problem figures



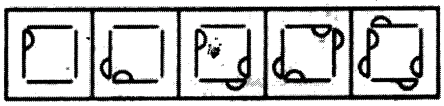
Answer Figures



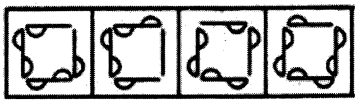
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

23. Problem figures



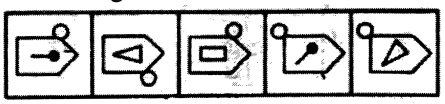
Answer Figures



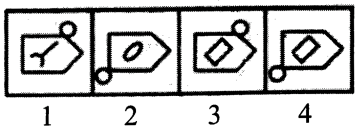
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

24. Problem figures



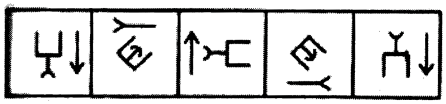
Answer Figures



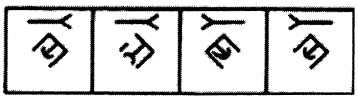
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

25. Problem figures



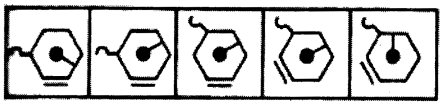
Answer Figures



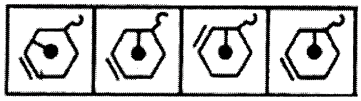
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

26. Problem figures



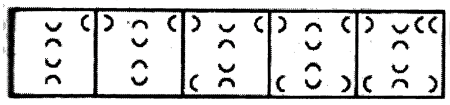
Answer Figures



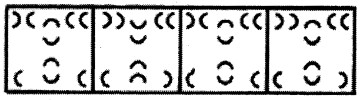
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

27. Problem figures



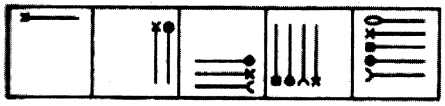
Answer Figures



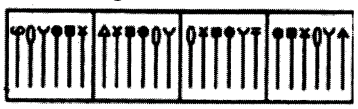
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

28. Problem figures



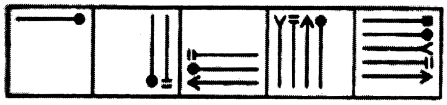
Answer Figures



1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

29. Problem figures

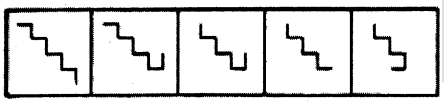


Answer Figures

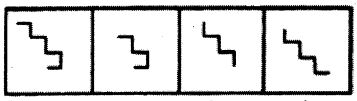
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

30. Problem figures



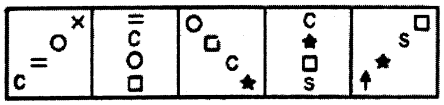
Answer Figures



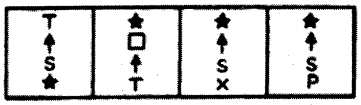
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

31. Problem figures



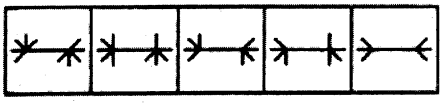
Answer Figures



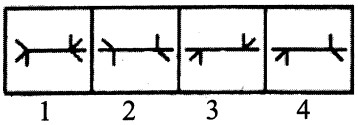
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

32. Problem figures



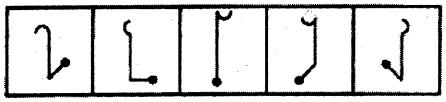
Answer Figures



1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

33. Problem figures

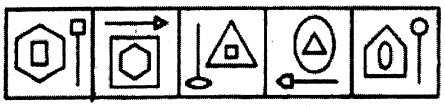


Answer Figures

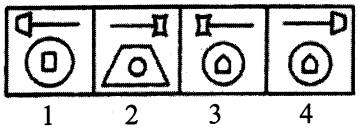
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

34. Problem figures



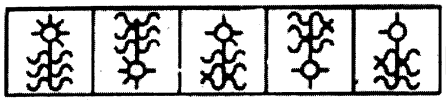
Answer Figures



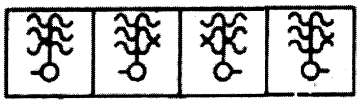
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

35. Problem figures



Answer Figures

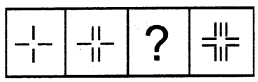


1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

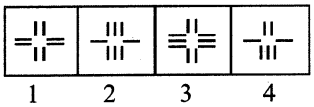
Directions (36–40): In each of the following questions, there is a set of four figures called problem figures followed by a set of four other figures called answer figures. Problem figures contains a question mark. Select a suitable figure from the answer figures which will substitute this question mark so that a series is formed.

Problem Figures



Answer Figures

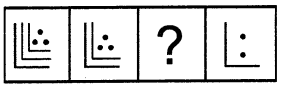
36.



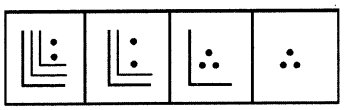
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

37. Problem Figures



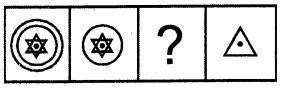
Answer Figures



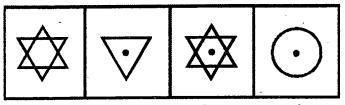
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

38. Problem Figures



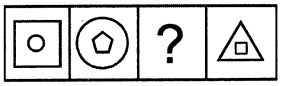
Answer Figures



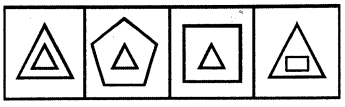
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

39. Problem Figures



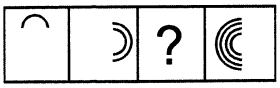
Answer Figures



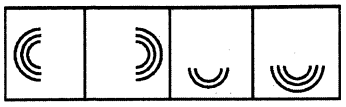
1 2 3 4

(A) 1 (B) 2 (C) 3 (D) 4

40. Problem Figures



Answer Figures



1 2 3 4

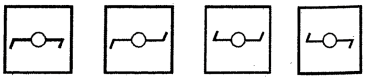
(A) 1 (B) 2 (C) 3 (D) 4

EXERCISE – II

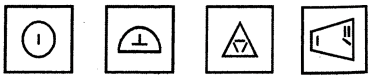
PREVIOUS YEAR QUESTION (NTSE)

Directions (1 – 6): In the following questions, some figures are given in a sequence. There is a sequence according to which the problem figures are arranged, select one figure from the set of answer figures which can be placed in sequence after the set of problem figures.

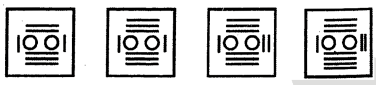
(NTSE Stage-I/Raj./2007)

1. 

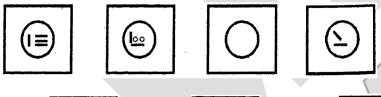
(A)  (B)  (C)  (D) 

2. 

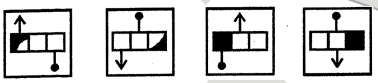
(A)  (B)  (C)  (D) 

3. 

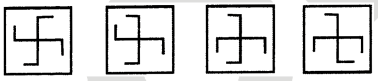
(A)  (B)  (C)  (D) 

4. 

(A)  (B)  (C)  (D) 

5. 

(A)  (B)  (C)  (D) 

6. 

(A)  (B)  (C)  (D) 

Directions (7 – 11) : In the following questions, some figures are given in a sequence. Find out the figure from the alternatives, which will come in place of the question mark to continue the sequence.

(NTSE Stage-II, 2007)

7. 

(A)  (B) 

(C)  (D) 

8. 

(A)  (B) 

(C)  (D) 

9. 

(A)  (B) 

(C)  (D) 

10. 

(A)  (B) 

(C)  (D) 

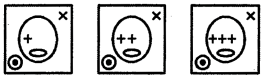
11. 

(A)  (B) 

(C)  (D) 

Directions (12 – 16) : In the following questions, some figures are given in a sequence. Problem figures are arranged in a sequence. One figure from the answer–figures is to be selected such that it can be placed after the series of problem figures.

(NTSE Stage-I/Raj./2008)

12. 

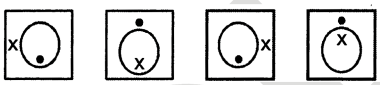
(A)  (B)  (C)  (D) 

13. 

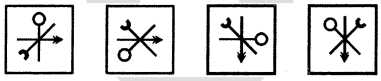
(A)  (B)  (C)  (D) 

14. 

(A)  (B)  (C)  (D) 

15. 

(A)  (B)  (C)  (D) 

16. 

(A)  (B)  (C)  (D) 

Directions (17 – 38) : Study the pattern of figures given in each question to find out the relationship among them. One figure is missing. Choose the missing figure from the alternatives.

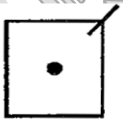
(NTSE Stage-II, 2008)

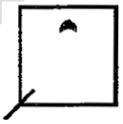
17. 

(A)  (B) 

(C)  (D) 

18. 

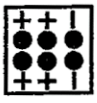
(A)  (B) 

(C)  (D) 

Directions (19 – 20) : In the following questions, series of figures are given. Find the correct alternative to continue the series.

(NTSEStage-II, 2008)

19. 

(A)  (B) 

(C)  (D) 

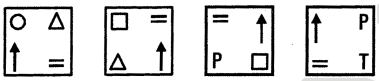
20. 

(A)  (B) 

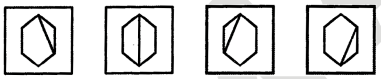
(C)  (D) 

Directions (21–25) : In the following questions, some figures are given in a sequence. There is a sequence according to which the problem figures are arranged. One figure of answer figures is to be selected which can be placed in sequence of problem figures. Find the correct option of the selected answer figure.

[NTSE Stage-I/Raj./2009]

21. 

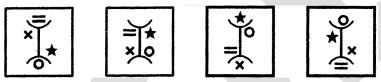
(A)  (B)  (C)  (D) 

22. 

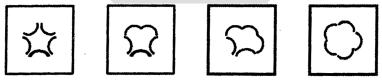
(A)  (B)  (C)  (D) 

23. 

(A)  (B)  (C)  (D) 

24. 

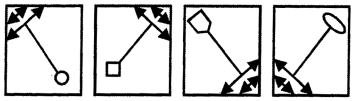
(A)  (B)  (C)  (D) 

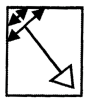
25. 

(A)  (B)  (C)  (D) 

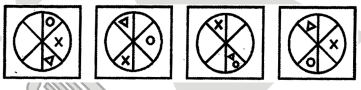
Directions (26–29) : The figures in each of the questions follow a series. Select the figure form the given alternatives which would continue the series.

[NTSE Stage-II, 2009]

26. 

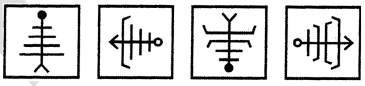
(A)  (B) 

(C)  (D) 

27. 

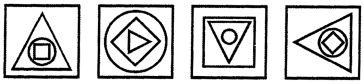
(A)  (B) 

(C)  (D) 

28. 

(A)  (B) 

(C)  (D) 

29. 

(A)  (B)  (C)  (D) 

30. Write the correct choice which would be required to continue with the series.

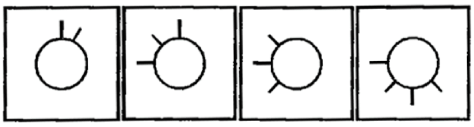
[NTSE Stage-II, 2009]

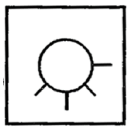
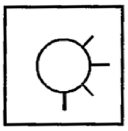
(A)  (B) 

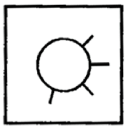
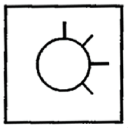
(C)  (D) 

Directions (31–35) : The figures in each of the questions follow a series. Select the figure form the given alternatives which would continue the series.

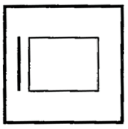
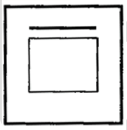
[NTSE Stage-I/Raj./2012]

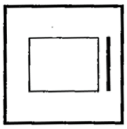
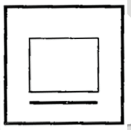
31. 

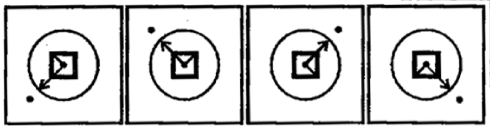
(A)  (B) 

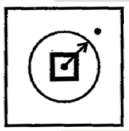
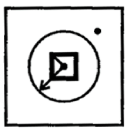
(C)  (D) 

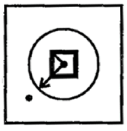
32. 

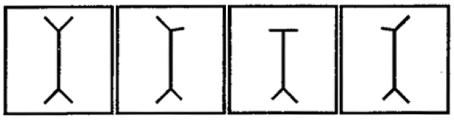
(A)  (B) 

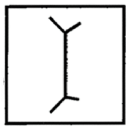
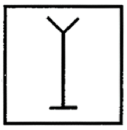
(C)  (D) 

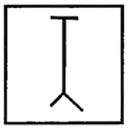
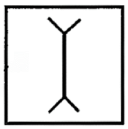
33. 

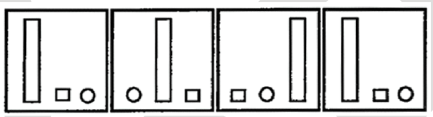
(A)  (B) 

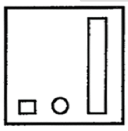
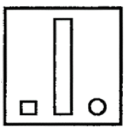
(C)  (D) 

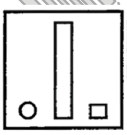
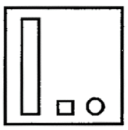
34. 

(A)  (B) 

(C)  (D) 

35. 

(A)  (B) 

(C)  (D) 

Directions (36 – 39) : In the following questions, some figures are given in a sequence. One figure from the Answer figures is to be selected such that it can be placed after the series of Question – figures. Fi nd the correct Serial number of the selected Answer – figures.

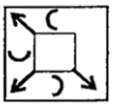
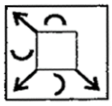
(NTSE Stage-I/Raj./2013)

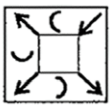
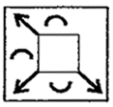
36. 

(A)  (B) 

(C)  (D) 

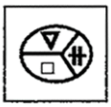
37. 

(A)  (B) 

(C)  (D) 

38. 

(A)  (B) 

(C)  (D) 

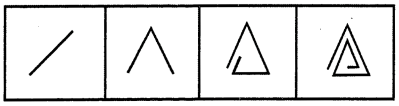
39. 

(A)  (B) 

(C)  (D) 

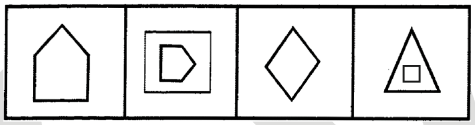
Directions (40–44) : In the following questions, some figures are given in a sequence. There is a sequence according to which the problem – figures are arranged. You have to select one figure from the set of answer – figures which can be placed in sequence after the set fo problem – figures. Find out the correct figure.

(NTSE Stage-I/Raj./2014)

40. 

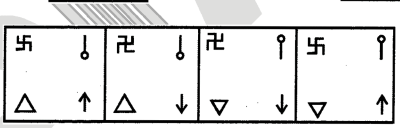
(A)  (B) 

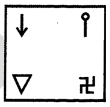
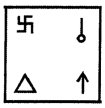
(C)  (D) 

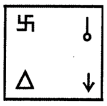
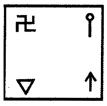
41. 

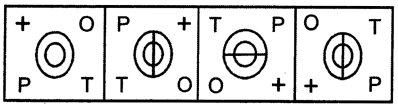
(A)  (B) 

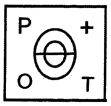
(C)  (D) 

42. 

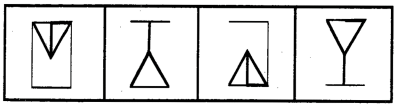
(A)  (B) 

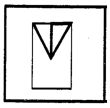
(C)  (D) 

43. 

(A)  (B) 

(C)  (D) 

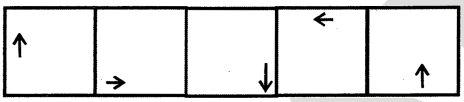
44. 

(A)  (B) 

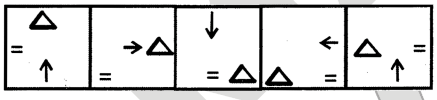
(C)  (D) 

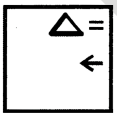
Directions (45–46) : In the following questions, somefigures are given in a sequence.One set contains problem-figures while the other has answer figure. There is a sequence according to which the problem-figures are arranged. You have to select one figure problem-figures. Find the out the corect figure.

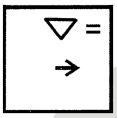
[NTSE Stage-I/Raj./2015]

45. 

(A)  (B)  (C)  (D) 

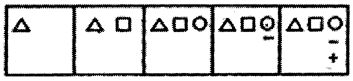
46. 

(A)  (B) 

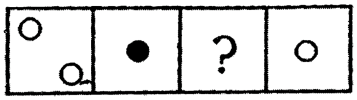
(C)  (D) 

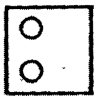
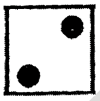
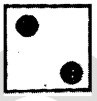
Directions (47–48) : In the following questions, some figures are given in a sequence. There is a sequence according to which the problem figures are arranged. You have to select an answer figure which can be added in sequence in the problem figures. Choose the correct figure.

[NTSE Stage-I/Raj./2016]

47. 

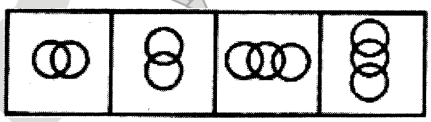
(A)  (B)  (C)  (D) 

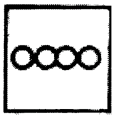
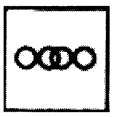
48. 

(A)  (B)  (C)  (D) 

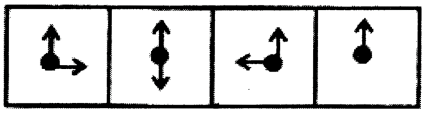
Directions (49–52) : In the following questions, some figures are given in a sequence. There is a sequence according to which the problem-figure are arranged. You have to select an answer-figure which can be added in sequence with the problem figures. Choose the correct figures.

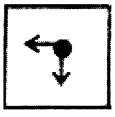
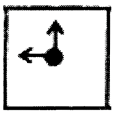
[NTSE Stage-I/Raj.2017]

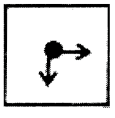
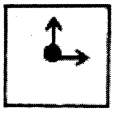
49. 

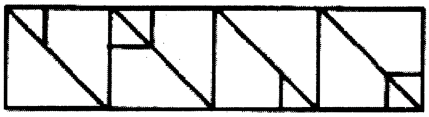
(A)  (B) 

(C)  (D) 

50. 

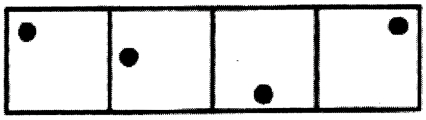
(A)  (B) 

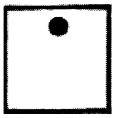
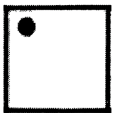
(C)  (D) 

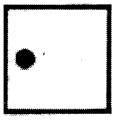
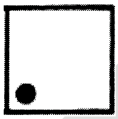
51. 

(A)  (B) 

(C)  (D) 

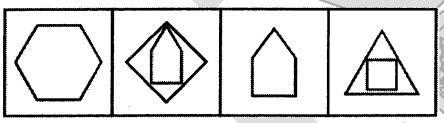
52. 

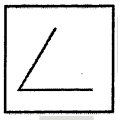
(A)  (B) 

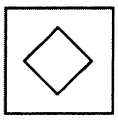
(C)  (D) 

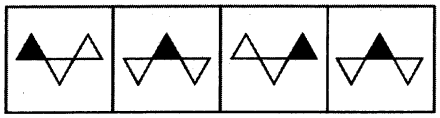
Directions (53–56) : In the following questions, some figures are given in a sequence. There is a sequence according to which the problem-figure are arranged. You have to select an answer-figure which can be added in sequence with the problem figures. Choose the correct figures.

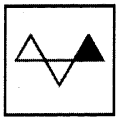
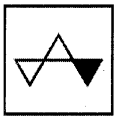
[NTSE Stage-I/Raj.2018]

53. 

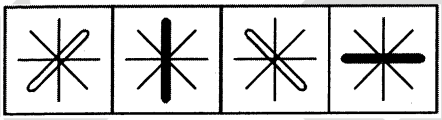
(A)  (B) 

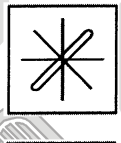
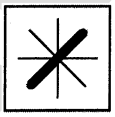
(C)  (D) 

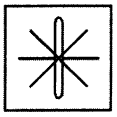
54. 

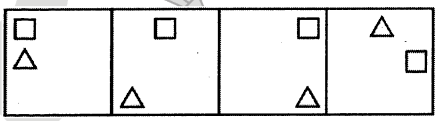
(A)  (B) 

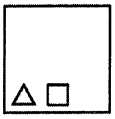
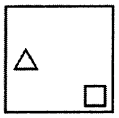
(C)  (D) 

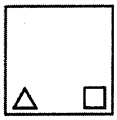
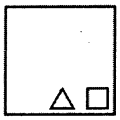
55. 

(A)  (B) 

(C)  (D) 

56. 

(A)  (B) 

(C)  (D) 

Answer Key

EXERCISE–I														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
D	D	C	C	C	D	B	B	D	B	A	D	A	D	D
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
C	C	A	D	D	B	C	C	C	D	D	D	D	C	B
31	32	33	34	35	36	37	38	39	40					
D	D	B	D	D	A	B	C	B	D					

EXERCISE–II														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
D	A	C	C	B	C	B	D	D	D	A	D	B	D	A
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
D	B	C	B	C	C	D	A	B	A	A	C	C	B	C
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
A	B	C	D	C	B	A	D	B	A	B	B	C	C	B
46	47	48	49	50	51	52	53	54	55	56				
D	B	C	C	D	A	D	D	C	A	D				

SELF PROGRESS ASSESSMENT FRAMEWORK

(CHAPTER : NON-VERBAL SERIES)

CONTENT	STATUS	DATE OF COMPLETION	SELF SIGNATURE
Theory			
In-Text Examples			
Solved Examples			
NCERT Exercises			
Exercise I			
Exercise II			
Short Note-1			
Revision - 1			
Revision - 2			
Revision - 3			
Remark			

NOTES :

1. In the status, put "completed" only when you have thoroughly worked through this particular section.
2. Always remember to put down the date of completion correctly. It will help you in future at the time of revision.

Space for Notes :

DIRECTION SENSE TEST

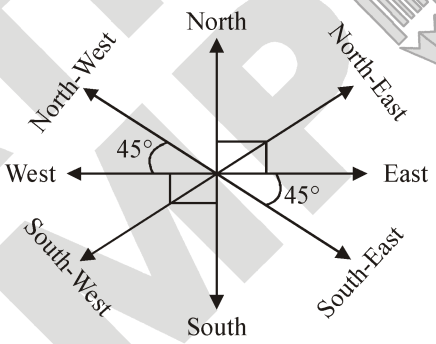
3

INTRODUCTION

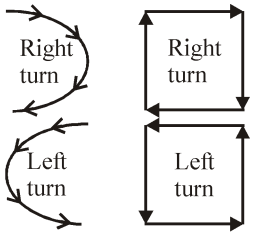
The topic Direction sense test (Distance & Direction) is referred to directly in the syllabus prescribed by NTSE problems related to Distance & Direction is included in the syllabus for Main Examination. Therefore, it is necessary to deal with the said topic.

In this type of questions a successive follow-up of directions and / or distance is formulated and on the basis of given information you are required to as certain the final direction with respect to the starting point or the shortest distance between the starting point and the final point. Sometimes both the final direction and the distance covered are asked. Thus, in this test, the questions consists of a sort of direction and/or distance puzzle. Obviously, such questions are meant to judge the candidate's ability to trace, follow and perceive the direction, described in some what complicated language, correctly. In order to solve such questions correctly you must have the knowledge of directions on the plane of a paper. At the same time, it is necessary to sketch out the directions as per the information provided in the question in proper sequence. An error at any point would alter your answer choice.

The diagram given below shows the four main directions (cardinals) and the four subsidiary directions on a plane of paper :



Generally right and left turns are frequently employed in the questions in order to confuse the candidates. Remember that examiner does possess the uncanny knack and he/she may confuse you by making verbose statements also. But, there is nothing to panic. You may note that on the surface of paper, the direction of right turn is always clockwise and that of left turn is anticlockwise. Thus,



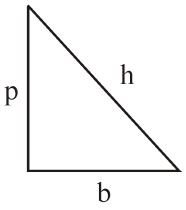
In order to determine the distance travelled or the shortest straight distance between the two given points, the Pythagorus formula

$h^2 = b^2 + p^2$ proves to be helpful.

Here, h = Hypotenuse

p = Perpendicular

b = Base



SOLVED EXAMPLES

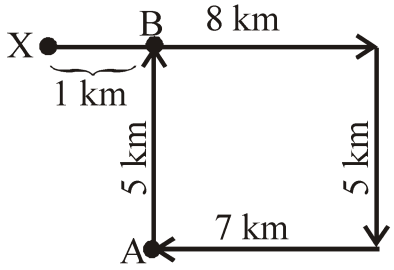
SE. 1

Sohan started from point X and travelled forward 8 km up to point Y, then turned towards right and travelled 5 km up to point Z, then turned right and travelled 7 km up to point A and then turned towards right and travelled 5 km up to B. What is the distance between point B and X ?

(A) 1 km (B) 2 km

(C) 3 km (D) 4 km

Ans.



Hence, the answer is (A).

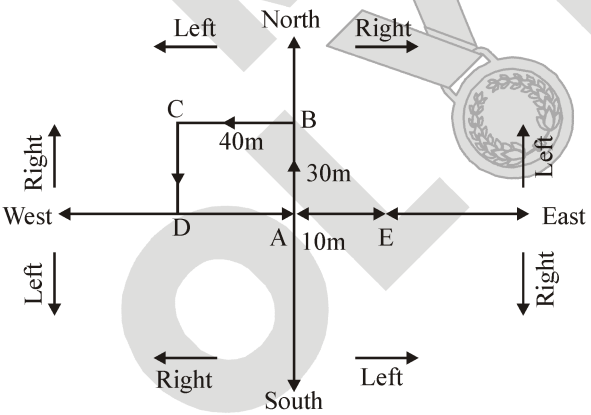
SE. 2

Ankit started walking towards North. After walking 30 m, he turned towards left and walked 40 m. He then turned left and walked 30 m. He again turned left walked 50 m. How far is he from his original position?

(A) 50m (B) 40m

(C) 30m (D) 10 m

Ans.



From fig. the final position of Ankit is E and starting point is A. Therefore, he is only 10 m away from his starting point. Hence, the answer is (D).

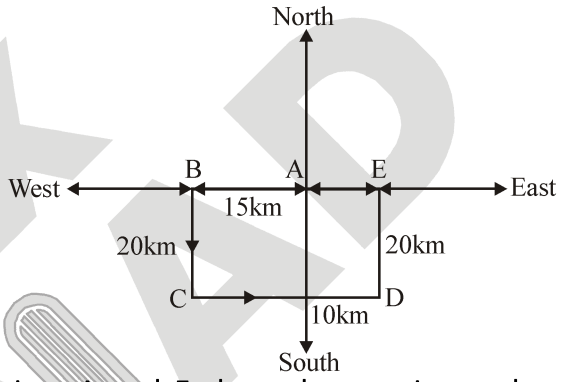
SE. 3

Lakshman went 15 km to the west from his house, then turned left and walked 20 km. He then turned East and walked 25 km and finally turning left covered 20 km. How far is he now from his house?

(A) 15 km (B) 20 km

(C) 25 km (D) 10 km

Ans.



Points A and E show the starting and end position respectively of Lakshman. It is clear that E is 10 km away from A. Hence, the answer is (D).

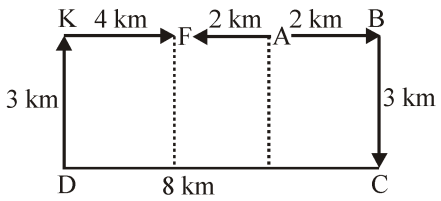
SE. 4

Sheela walks from A to B which is 2 km away, turns right at 90º and walks for 3 km. to point C, turns right at 90º and walks to D which is 8 km. away, turns 90º right and goes 3 km. to point K. Then, once again she turns right 90º and walks 4 km. to point F. How far is it from A to F?

(A) 2 km. (B) 4 km.

(C) 6 km. (D) 8 km.

Ans.



Distance between A and F = 2 km

Hence, the answer is (A).

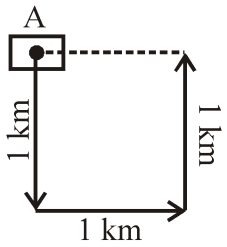
SE. 5

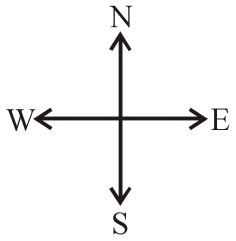
Mohan starts from point A and walks 1 km towards south, turns left and walks 1 km. Then he turns left again and walks 1 km. Now he is facing.

(A) East (B) West

(C) North (D) South-West

Ans.





It is clear from the diagram that Mohan is facing towards North.

Hence, the answer is (C).

Space for Notes :

EXERCISE – I

MULTIPLE CHOICE QUESTIONS

1. Anil left home and cycled 10 km southwards, turned right and cycled 5 km & turned right and cycled 10 km and turend left and cycled 10 km. How many kilometer will he have to cycle to reach his home straight ?
   (A) 10 km (B) 15 km
   (C) 20 km (D) 25 km
2. 'A' travelled westward 5 km, turned left and travelled 3 km, turned right and travelled 9 km. He then travelled North 3 km. How far was 'A' from the starting point now ?
   (A) 3 km (B) 5 km
   (C) 10 km (D) 14 km
3. Amar travels 1 km due East, then 5 km due South, then 2 km due East and finally 9 km due North. How far is from the starting point ?
   (A) 16 km (B) 8 km
   (C) 6 km (D) 5 km
4. Amit walks 2 km South, turned right and walked 1 km, again turned North and walked 5 km, turned East and walked 5 km. How far is he from the starting point ?
   (A) 3 km (B) 7 km
   (C) 5 km (D) 6 km
5. Kumar stands with his face pointing to the South-East direction. He walked 15 metre and then turned Northwards and walked another 12 metre. How far was he then from the starting point ?
   (A) 12 metre (B) 10 metre
   (C) 9 metre (D) 5 metre
6. A man walked 3 metre towards North, turned West and walked 2 metre then turned North and walked 1 metre and finally turned East and walked 5 metre. How far is he from the starting point ?
   (A) 5 metre
   (B) 8 metre
   (C) 10 metre
   (D) 12 metre
7. Amit faces towards North. Turning to his right he walks 25 metre. He then turns to his left and walks 30 metre. Then moves 25 metre to his right. He then turns to his right again and walks 55 metre. Finally, he turns to the right and moves 40 metre. In which direction is he now from his starting point ?
   (A) South-West (B) South
   (C) North–West (D) South-East
8. Kishan walks 10 km towards North. From there he walks 6 km towards South. Then he walks 3 km towards East. How far and in which direction is he with reference to his starting point ?
   (A) 5 km, North (B) 5 km, North-East
   (C) 7 km, East (D) 7 km, West
9. A man was facing East. He took three paces forward turned right, walked another two paces and then turned about. Which direction was he last facing ?
   (A) East (B) North
   (C) South (D) None of these
10. I am facing South. I turn right and walk 20 m. Then I turn right again and walk 10 m. Then I turn left and walk 10 m. and then turning right and walk 20 m. Then I turn right again and walk 60 m. In which direction am I from the starting point ?
    (A) North (B) North-West
    (C) East (D) North-East
11. A watch reads 4 : 30. If the minute-hand point to East, in which direction does the hour-hand point ?
    (A) North-East (B) South-East
    (C) North-West (D) North
12. I went 15 m to the North, then turned West and covered 10 m, then turned South and covered 5 m then turned East and covered 10 m. In which direction am I now from my house ?
    (A) North (B) South
    (C) East (D) West

13. At my house I am facing West, then I turn left and go 10 m, then I turn 90° anit-clockwise and go 5 m then I go 5 m to the South and from there 5 m to the West. In which direction am I from my house ?
(A) East (B) West
(C) North (D) South

14. Sanjay went 70 metre in the East before turning to his right. He went 10 metre before turning to his right again and went 10 metre from this point. From here he went 90 metre to the North. How far was he from the starting point ?
(A) 80 metre (B) 100 metre
(C) 140 metre (D) 260 metre

15. A and B start walking from the same point. A goes North and covers 3 km; then turn right and covers 4 km. B goes West and covers 5 km, then turns right and covers 3 km. How far apart are they from each other ?
(A) 10 km (B) 9 km
(C) 8 km (D) 5 km

16. L is to South-West of K, M is to the East of L and South-East of K and N is to the North of M is line with LK. In which direction of K is N located ?
(A) North (B) East
(C) South-East (D) North-East

17. Anoop starts walking towards South. After walking 15 m he turns towards North. After walking 20 m, he turns towards East and walks 10m. He then turns towards South and walks 5 m. How far is he from his original position and in which direction ?
(A) 10 m, North
(B) 10 m, South
(C) 10 m, West
(D) 10 m, East

18. Village Chimur is 20 km to the North of village Rewa. Village Rahate is 18 km to the East of village Rewa. Village Angne is 12 km to the West of Chimur. If Sanjay starts from village Rahate and goes to village Angne, in which direction is he from his starting point?
(A) North (B) North-West
(C) South (D) South-East

19. From a point, Rajneesh started walking East and walked 35 m. He then turned on his right and walked 20 m and he again turned right and walked 35 m. Finally, he turned his left and walked 20 m and reached his destination. Now, how far is he from the starting point ?
(A) 50m (B) 55m
(C) 20m (D) 40 m

20. A rat runs 20 m towards East and turns to right, runs 10 m and turns to right, runs 9 m and again turns to left, runs 5 m and then turns to left, runs 12 m and finally turns to left and runs 6 m. Now, which direction is the rat facing?
(A) East (B) North
(C) West (D) South

21. A man goes towards East 5 km, then he takes a turn to South-West and goes 5 km. He again takes a turn towards North-West and goes 5 km with respect to the point from where he started, where is he now?
(A) At the starting point (B) West
(C) East (D) North-East

22. Vijayan started walking towards South. After walking 15 m, he turned to the left and walked 15 m. He again turned to his left and walked 15 m. How far is he from his original position and in which direction ?
(A) 15 m, North (B) 15 m, South
(C) 30 m, East (D) None of these

23. Rakesh is standing at a point. He walks 20 m towards the East and further 10 m towards the South, then he walks 35 m towards the West and further 5 m towards the North, then he walks 15 m towards the East. What is the straight distance in metres between his starting point and the point where he reached last?
(A) 0 (B) 5
(C) 10 (D) Can't be determined

24. Rahim started from point X and walked straight 5 km West, then turned left and walked straight 2 km and again turned left and walked straight 7 km. In which direction is he from the point X ?
(A) North-East (B) South-West
(C) South-East (D) North-West

25. Ravi travelled 4 km straight towards South. He turned left and travelled 6 km straight, then turned right and travelled 4 km straight. How far is he from the starting point?
(A) 8 km (B) 10 km
(C) 12 km (D) None of these

26. Mohan started from point 'A' and proceeded 7 km straight towards East, then he turned left and proceeded straight for a distance of 10 km. He then turned left again and proceeded straight for a distance of 6 km, and then turned left again and proceeded straight for another 10 km. In which direction is Mohan from his starting point?
(A) East (B) West
(C) North (D) South

Directions (27 – 29): A, B, C, D, E, F, G, H and I are nine houses C is 2 km East of B. A is 1 km North of B and H is 2 km South of A. G is 1 km West of H while D is 3 km East of G and F is 2 km North of G. I is situated just in middle of B and C while E is just in middle of H and D.

27. Distance between E and G is
(A) 1 km (B) 1.5 km
(C) 2 km (D) 5 km

28. Distance between E and I is
(A) 1 km (B) 2 km
(C) 3 km (D) 4 km

29. Distance between A and F is
(A) 1 km (B) 1.41 km
(C) 2 km (D) 3 km

Directions (30 – 31) : On a playing ground, Dinesh, Kunal, Nitin, Atul and Prashant are standing as described below facing the North.
(i) Kunal is 40 metres to the right of Atul.
(ii) Dinesh is 60 metres to the South of Kunal.
(iii) Nitin is 25 metres to the West to Atul.
(iv) Prashant is 90 metres to the North of Dinesh.

30. Who is to the North-East of the person who is to the left of Kunal ?
(A) Dinesh (B) Nitin
(C) Atul (D) None of these

31. If a boy walks from Nitin, meets Atul followed by Kunal, Dinesh and then Prashant, how many metres has he walked if he has travelled the straight distance all through ?
(A) 155 metres (B) 185 metres
(C) 215 metres (D) 245 metres

EXERCISE – II

MULTIPLE CHOICE QUESTIONS

1. Ramesh starts walking from his house at 4 PM facing towards sun and walks 5 km. Then he turns left and walks 8 km. Again turning to left he walks 13 km and reaches Mohan's house. In which direction Ramesh's house is from Mohan's house ?

(NTSE Stage-I/Raj./2008)

(A) North-West (B) North-East
(C) South-West (D) South-East

2. Vinod travelled 6 km South from the starting point D, then turned right and moved 4 km and again turned right and travelled 6 km and turned left and travelled 8 km. How many kilometre he has to cover to reach his starting point D?

(NTSE Stage-II, 2008)

(A) 10 km (B) 12 km
(C) 14 km (D) 16 km

3. Suresh moves a distance of 7 km from a place P towards North, then turns left and walks 4 km, again turns towards right and walks 3 km, then again turns right and walks 2 km to reach his destination Q. Which direction is he facing now ?

(NTSE Stage-II, 2008)

(A) West (B) East
(C) North-West (D) South

4. A child goes 50 metre towards South and then turning to his right, he goes 50 metre. Then turning to his left, he goes 30 metre. Again he turns to his left and goes 50 metre. How far is he from his inital position ? **(NTSE Stage-II, 2008)**

(A) 30 metre (B) 40 metre
(C) 50 metre (D) 80 metre

5. Ganesh moves 20 metre towards East from his house. Then he turns left 3 times, each time covering a distance of 20 metre. Finally he takes 2 successive right turns, each time covering a distance of 20 metres. In which direction is he with respect to his house ?

(NTSE Stage-II, 2009)

(A) North (B) North-East
(C) South- West (D) North-West

6. Ashok is facing North. He turns 45 degrees in the clockwise direction and then turns 90 degrees in the anticlockwise direction. Finally, he turns back. Which direction is he facing now ?

(NTSE Stage-II, 2009)

(A) South-East (B) South-West
(C) North-East (D) North-West

7. Shabnam's school bus picks her up from her house and takes two left turns and one right turn to reach her school. If the bus is facing East, while reaching the school, which direction was the bus facing at her home ?

(NTSE Stage-II, 2009)

(A) North (B) South
(C) East (D) West

8. One morning Ram and Shyam were talking to each other face to face. If Shyam's shadow was exactly to the right of Ram, which direction Shyam was facing ?

(NTSE Stage-II, 2009)

(A) South (B) East
(C) West (D) North

9. Prakash moves 40 km in the direction of North then he turns to right and moves 50 km. After this he turns to right and moves 30 km. Again he turns to right and moves 50 km. How many kilometers away is he from the starting point ?

(NTSE Stage-II, 2009)

10. Shalini is standing at the South-East corner of a rectangular field. She starts crossing the field diagonally. After walking half the distance she turns right, walks some distance and turns left. Which direction is Shalini facing now ?

(NTSE Stage-II, 2011)

(A) South-East
(B) South-West
(C) North-East
(D) North-West

11. One morning after sunrise, Seema was standing facing a pole. The shadow of the pole fell exactly to her right. Which direction was she facing ?

(NTSE Stage-II, 2011)

(A) North (B) South
(C) West (D) East

12. Rahul travels 10 km to the North. He turns to the right and walks 5 km. Then again he turns to his right and moves 10 km forwards. How many km away from starting point is he ?

(NTSE Stage-II, 2011)

(A) 26 km
(B) 19 km
(C) 13 km
(D) 5 km

13. Ram start from a point P, drives 2 km towards North. He then turns to his left and drives 3 km and after taking another turn to his left the drives 2 km, and finishes at point Q. After the first turn in which direction Ram will be driving ?

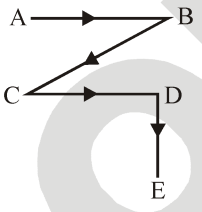
(NTSE Stage-II, 2011)

(A) West (B) North
(C) East (D) South

14. Rakesh start from A and walks towards East to B. He turns South and walks to C. Then he turns North-West and walks to D. Finally he turns South-West and comes to E. Which of the answer figures shows the exact path he traced ?

(NTSE Stage-II, 2011)

(A)



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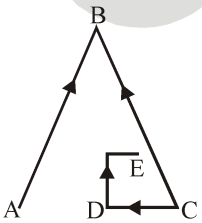

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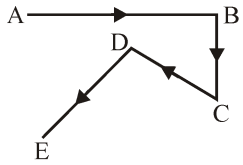
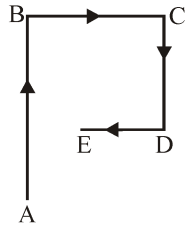


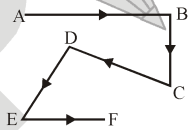
(D)



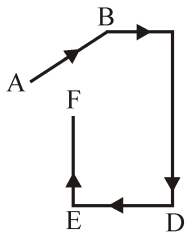
15. Pankaj start from A and walks North-East to B. He turns West and walks to C. Then turns South and walks to D. He then turns East and walks to E. Finally he turns South-West and walks to F. Which of the answer figures exactiy shows the path Pankaj traced ?

(NTSE Stage-II, 2011)

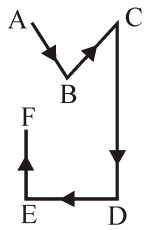
(A)



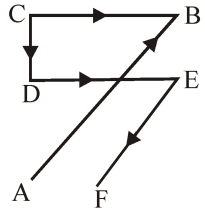
(B)



(C)



(D)



16. Madhu walks 15 metres towards North, then she turns left at 90º and walk 30 metre, then turns right at 90º and walks 25 metres. How far, she is from the starting point and in which direction ?

(NTSE Stage-II, 2015)

(A) 55 mt., North-East
(B) 50 mt., North-West
(C) 60 mt., North
(D) 50 mt., West

17. A ship navigating in the India Ocean is hit by a sea storm and drifts as follows :
40 km North
28 km North – West
36 km West
52 km South and 29 km South East.
The ship had finally drifted in.....direction from its original position.

(NTSE Stage-II, 2015)

(A) South – West (B) South
(C) West (D) South – East

18. Ram travels 8 km to South, then moves to right and travels 6 km and at the end he again moves right and travels 8 km. Then the distance of Ram from initial point is.

(NTSE Stage-I, 2016)

(A) 6 km (B) 8 km
(C) 10 km (D) 14 km

19. If North direction is called East and South direction is called West, then what will be called North-East direction ?

(NTSE Stage-I, 2017)

(A) North-East (B) East-South
(C) West-South (D) North-West

20. A,B,C and D are playing carrom. C, A and D, B are partners. D is to the right of C. C is facing West. Then, B is facing which direction ?

(NTSE Stage-I, 2018)

(A) North (B) South
(C) East (D) West

21. If 'South–east' is called 'East', 'North–West' is called 'West', 'South–west' is called 'South', then in the same way, 'North' will be called as

(NTSE Stage-I, 2018)

(A) East (B) North–east
(C) North–west (D) West

Space for Notes :

Answer Key

EXERCISE–I														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	D	D	C	C	A	D	B	A	D	A	A	D	B	B
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
D	D	B	D	B	A	D	B	C	B	A	C	A	A	D
31														
C														

EXERCISE–II														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	B	B	D	D	A	B	D	10	D	B	D	A	C	D
16	17	18	19	20	21									
B	A	A	B	A	C									

SELF PROGRESS ASSESSMENT FRAMEWORK

(CHAPTER : DIRECTION SENSE TEST)

CONTENT	STATUS	DATE OF COMPLETION	SELF SIGNATURE
Theory			
In-Text Examples			
Solved Examples			
Exercise I			
Exercise II			
Short Note-1			
Revision - 1			
Revision - 2			
Revision - 3			
Remark			

NOTES :

1. In the status, put "completed" only when you have thoroughly worked through this particular section.
2. Always remember to put down the date of completion correctly. It will help you in future at the time of revision.

Space for Notes :

NUMBER, RANKING & ORDERING TEST

4

1. NUMBER QUIBBLE

In these type of questions, generally a set, group or series of numerals is given and the candidate is required to find out how many times a numeral satisfying the conditions, specified in the question occurs.

Example 1

Consider the series given below made up of numbers from 0 to 9. How many 5s are there which are followed by a 7 ?

2 5 7 8 5 9 6 3 3 5 7 5 2 0 4 3 6 9 5 7 3 5 7 5 7 5 1 5 5

(A) 5 (B) 3 (C) 7 (D) 4

Solution :

In the given question there are many 5s that are given, but we have to count only those 5s which are followed by a 7. The 5s that have been underlined are the ones which are followed by a 7.

2 5 7 8 5 9 6 3 3 5 7 5 2 0 4 3 6 9 5 7 3 5 7 5 7 5 1 5 5

Hence in the given series the number of 5s which are followed by 7 is '5'. Hence, the answer is (A).

2. RANKING TEST

In these type of questions, generally the ranks of a person both from the top and from the bottom are mentioned and the total number of persons is asked. However, sometimes this question is put in the form of a puzzle of interchanging seats by two persons.

Some Useful Information

1. Position of person from upward = [Total number of persons – position of person from down] + 1
2. Position of person from downward = [Total number of persons – position of person from up] + 1
3. Position of person from right= [Total number of persons – position of person from left] + 1
4. Position of person from left = [Total number of persons – position of person from right] + 1
5. Total number of persons = [Position of person from upward/right + position of person from downward/ left] – 1

Example 2

In a row of trees, a lemon tree is eight from the either end of the row. How many trees are there in total in the row ?

(A) 12 (B) 18 (C) 15 (D) 16

Solution :

Total number of trees in the row = 8 + 8 – 1 = 15. Hence, the answer is (C).

Example 3

In a row of girls, Mridula is 18^{th} from the right and Sanjana is 18^{th} from the left. If both of them exchange their position, Sanjana becomes 25^{th} from the left, how many girls are there in the row ?

(A) 40 (B) 41 (C) 42 (D) 35

Solution :

Sanjana's new position is 25^{th} from left. But it is the same as Mridula's earlier position which is 18^{th} from the right. Then the total number of girls are = (rank from left + rank from right) – 1 = (18 + 25) – 1 = 43 – 1 = 42. Hence, the answer is (C).

3. ORDERING TEST

In such type of questions, clues are given regarding comparisons among a set of persons or things with respect to their qualities. The candidate is required to analyses the whole information, form a proper ascending/descending sequence and then answer the given questions accordingly.

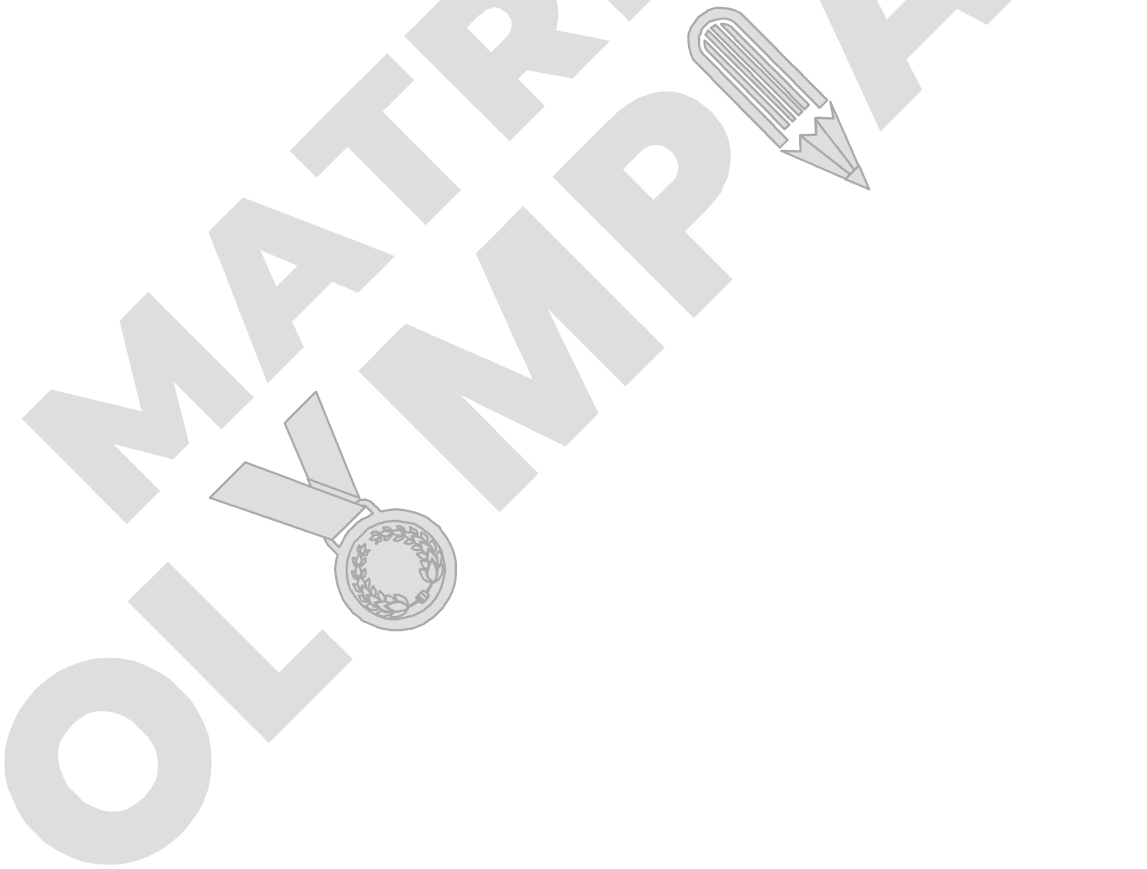
Example 4

A is shorter than B but much taller than E. C is the tallest and D is shorter than A and taller than E. Which one is the shortest ?

(A) A (B) E (C) B (D) D

Solution :

According to the given statement. E < D < A < B < C. Hence, the answer is (B).



SOLVED EXAMPLES

SE. 1

If 3 is subtracted from the middle digit of each of the following numbers and then the positions of the digits are reversed, which of the following will be the last digit of the middle number after they are arranged in descending order ?

589 362 554 371 442

(A) 1 (B) 2

(C) 3 (D) 4

Ans. On subtracting 3 from the middle digits, the numbers becomes.

559 332 524 341 412

Now, on reversing the positions of digits, we have :

955 333 425 143 214

Arranging these numbers in descending order, we have :

955 425 233 214 143

The middle number is 233 and its last digit is 3. Hence, the answer is (C).

SE. 2

In a Class Vidhya ranks 7^{th} from the top, Divya is 7 ranks ahead of Taruna and 3 ranks behind Vidhya, Sushma who is 4^{th} from the bottom, is 32 ranks behind Taruna. How many students are there in the class ?

(A) 52 (B) 49

(C) 50 (D) None of these

Ans. Vidhya's rank 7th from the top. Divya is 3rd rank behind Vidhya. So, Divya's rank will be 10th from the top. Vidhya is 7th ranks ahead of Taruna so, Taruna's ranks will be 17th from the top. Sushma is 32 ranks behind Taruna so, Sushma's rank from the top will be 49th and 4th from the bottom. Hence, total number of students = (49 + 4) – 1= 52. Hence, the answer is (A).

Directions (3 – 4) : Read following information carefully and answer the questions given below it :

(i) P, Q, R, S and T are five friends.

(ii) Q is elder to T.

(iii) R is younger to P.

(iv) P is younger to T.

(v) S is elder to P.

SE. 3

Who among the following is the eldest ?

(A) P (B) Q

(C) S (D) Data inadequate

SE. 4

Who among the following is the youngest ?

(A) P (B) R

(C) T (D) Data inadequate

Ans. **(3 – 4) :** Thus, sequence of their age becomes Q > T > S > P > R or Q > S > T > P > R or S > Q > T > P > R

3. According to a given statement there are three are three sequences, as follows :

Q > T > S > P > R or Q > S > T > P > R or S > Q > T > P > R. Hence, the answer is (D).

4. Clearly, R is the youngest. Hence, the answer is (B).

EXERCISE – I

MULTIPLE CHOICE QUESTIONS

1. How many 5s are there in the following number sequence which are immediately preceded by 7 and immediately following 6 ?
7 5 5 9 4 5 7 6 4 5 9 8 7 5 6 7 6 4 3 2 5 6 7 8
(A) One (B) Two (C) Three (D) Four

2. How many 6s are there in the following number series, each of which is immediately preceded by 1 or 5 and immediately followed by 3 or 9 ?
2 6 3 7 5 6 4 2 9 6 1 3 4 1 6 3 9 1 5 6 9 2 3 1 6 5 4 3 2 1 9 6 7 1 6 3
(A) None (B) One (C) Two (D) Three

3. How many 7s 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

Directions (4 – 6) : Study the following five numbers and answer the questions given below :
517 325 639 841 792

4. What will be the first digit of the second highest number after the positions of only the second and the third digits within each number are interchanged?
(A) 2 (B) 7 (C) 8 (D) 9

5. What will be the last digit of the third number from top when they are arranged in descending order after reversing the positions of the digits within each number ?
(A) 2 (B) 3 (C) 5 (D) 7

6. What will be the middle digit of the second lowest number after the positions of only the first and the second digits within each number are interchanged?
(A) 2 (B) 3 (C) 5 (D) 7

Directions (7 – 11) : Read the following information and answer the questions given below it :
Alka is older than Mala. Gopal is older than Mala but younger than Alka. Kapil is younger than Ram and Mala. Mala is older than Ram.

7. Whose age is between Gopal and Ram ?
(A) Mala (B) Kapil
(C) Alka (D) None of these

8. Whose age is between Mala and Kapil ?
(A) Gopal (B) Ram
(C) Alka (D) None of these

9. Whose age is exactly in the middle of all the five ?
(A) Mala (B) Gopal (C) Ram (D) Alka

10. Who is the eldest ?
(A) Alka (B) Mala (C) Kapil (D) Gopal

11. Who is the youngest ?
(A) Mala (B) Ram (C) Alka (D) Kapil

12. Rajan is sixth from the left end and Vinay is tenth from the right end in a row of boys. If there are eight boys between Rajan and Vinay, how many boys are there in the row ?
(A) 23 (B) 24 (C) 25 (D) 26

13. In a row of forty children, P is thirteenth from the left end and Q is ninth from the right end. How many children are there between P and R if R is fourth to the left of Q ?
(A) 12 (B) 13 (C) 14 (D) 15

14. In a group of six children, Q is taller than P but not as tall as L. M is taller than N and O, but not as tall as P. Who is the shortest among them ?
(A) N (B) O
(C) M (D) Data inadequate

15. R earns more than H but not as much as T, M earns more than R. Who earns least among them ?
(A) H (B) R (C) T (D) M

16. In a queue I am the last person while my friend is seventh from the front. If the person exactly between me and my friend is on the 23rd position from the front, what is my position in the queue ?
(A) 37 (B) 36 (C) 40 (D) 39

17. Sam ranked ninth from the top and thirty-eighth from the bottom in a class. How many students are there in the class?
(A) 45 (B) 46 (C) 47 (D) 48

18. A class of boys stands in a single line. One boy is nineteenth in order from both the ends. How many boys are there in the class?
(A) 27 (B) 37 (C) 38 (D) 39

19. If Atul finds that he is twelth from the right in a line of boys and fourth from the left, how many boys should be added to the line such that there are 28 boys in the line?
(A) 12 (B) 13 (C) 14 (D) 20

20. In a row of boys, Jeevan is seventh from the start and eleventh from the end. In another row of boys, Vikas is tenth from the start and twelth from the end. How many boys are there in the rows together?
(A) 36 (B) 37
(C) 39 (D) None of these

21. Five boys took part in a race, Raj finished before Mohit but behind Gaurav, Ashish finished before Sachin but behind Mohit. Who won the race?
(A) Raj (B) Gaurav
(C) Mohit (D) Ashish

22. If you are eleventh in a queue starting from either end, how many persons in the queue?
(A) 11 (B) 20
(C) 21 (D) 22

23. Saran is eighteenth from the right end in a row of 50 boys. What is his position from the left end?
(A) 32 (B) 35 (C) 33 (D) 34

24. In a class of 90, where girls are twice that of boys, Shridar ranked fourteenth from the top, if there are 10 girls ahead of Shridar, how many boys are after him in rank?
(A) 23 (B) 26 (C) 25 (D) 22

25. Sita ranks nineteenth in a class of 68 students. What is her rank from last?
(A) 50 (B) 51 (C) 49 (D) 48

26. Raji is 5 ranks ahead of Raj in a class of 46 students. If raj's rank is twelth from the last, what is Raji's rank from the start?
(A) 30 (B) 31 (C) 28 (D) 38

27. Karthik is 6 ranks ahead of Subhash who ranks sixteenth in a class of 42. What is Karthik's rank from the last?
(A) 33 (B) 32 (C) 31 (D) 30

28. A ranks fourth in a class. B ranks ninth from the last, if C is ninth after A and just in the middle of A and B, how many students are there in the class?
(A) 33 (B) 32
(C) 34 (D) None of these

29. Akhil ranked seventeenth from the top and thirty seventh from the bottom in a class. How many students are there in the class?
(A) 53 (B) 45 (C) 54 (D) 52

30. Shakshi ranks eleventh in a class of 54 students. What is her rank from last?
(A) 43 (B) 44 (C) 42 (D) 40

31. Naresh is twenty two from the left end in a row of 47 boys. What is his position from the right end ?
(A) 24 (B) 25 (C) 23 (D) 26

32. Reshma and Praveena are ranked ninth and thirteenth from the top in a class of 57 students. What will be their respective ranks from the bottom of the class ?
(A) 48, 44 (B) 49, 45
(C) 45, 49 (D) 47, 43

EXERCISE – II

PREVIOUS YEAR QUESTION (NTSE)

1. How many odd numbers are in the following number series, which does not contains just after it an odd number, but contains an even number just before it?
3 5 8 1 4 9 7 6 1 5 9 2 3 4 8 5 2
[NTSE Stage-I/Raj./2007]
(A) 2 (B) 3 (C) 4 (D) 5

2. If all the even numbers in between numbers from 32 to 51 are arranged in a row then number at fifth position from right, will be –
[NTSE Stage-I/Raj./2007]
(A) 36 (B) 40 (C) 42 (D) 48

3. How many A are in the given letter series which does not has B just before it but has C just after it ?
D A C B A C D A C B C A C B A C B A D C
[NTSE Stage-I/Raj./2007]
(A) 3 (B) 4 (C) 5 (D) 6

4. How many 9's are there which come after 6 or multiple of 3 ?
6 9 9 9 6 9 7 9 6 9 7 9 5 9 2 9 8 9 6 9 6 9 9 9 9 7 9 8 9 6 9 7 8
[NTSE Stage-II, 2007]
(A) 7 (B) 9 (C) 11 (D) 6

5. Shyama ranked 12th from the top and 28th from the bottom among those children who passed the examination. Eight children failed in the examination while five children did not appear in the examination. How many children were there in the class ?
[NTSE Stage-II, 2007]
(A) 50 (B) 51 (C) 52 (D) 53

6. If you write all the numbers from 201 to 250, then how many times will you write the numeral 2 ?
[NTSE Stage-II, 2007]
(A) 70 (B) 65 (C) 25 (D) 80

7. How many c's are there in between two consonants in the following series ?
c a b c d c d c e c f c o c i c j c k c c k
[NTSE Stage-II, 2007]
(A) 4 (B) 5 (C) 6 (D) 11

8. How many times '+' come before '÷' and after '×'?
+ ÷ – × ∩ U × – ÷ + + × + ÷ – + ÷ ∩ U ÷ × + ÷ ∩ U + × ÷ – U × + ÷ ÷ × U ÷ × – ÷ U × + ÷ ∩ – + × ÷ × + ÷ ∩ × + ÷
[NTSE Stage-II, 2007]
(A) 6 (B) 5 (C) 4 (D) 7

9. There are five friends A, B, C, D and E. A is shorter than B but taller then E, C is tallest, D is little shorter then B and little taller than A. If they are standing in the order of their heights who will be in the middle ?
[NTSE Stage-I/Raj./ 2008]
(A) D (B) C (C) A (D) B

10. In the following series how many 4's are preceded by 5 but not following by 2 or 3.
5 4 5 4 7 6 5 4 2 3 8 5 4 1 1 5 4 6 3 6 4 2
[NTSE Stage-I/Raj./ 2008]
(A) 2 (B) 4 (C) 3 (D) 5

11. In a class the rank of Sohan is sixteen from the top and fortynine from the bottom. The total number of students in the class are –
[NTSE Stage-I/Raj./ 2008]
(A) 64 (B) 65 (C) 66 (D) 67

12. In the following series how many times 7, 8, 9 appear together when 7 being in the middle ?
7 2 8 7 9 2 1 7 8 9 1 6 7 4 2 1 7 9 7 8 2 8 9 7 2
[NTSE Stage-I/Raj./ 2009]
(A) 1 (B) 2 (C) 3 (D) 4

Direction (13–15) : Study the following number line and answer the questions that follow.
2 5 9 1 7 2 5 1 9 7 3 9 5 2 4 6 8 1 9 7 5 2 7 3 1 9 7 8 5 2 6 5 4 1 9 7 8 2 0 1 0 9 7 8 5 1 9 7 3 5 1 6 9 7 2 1 7 3 7 9 5 1
[NTSE Stage-II, 2009]

13. How many times is number '3' preceded by number '7' and not followed by an even number ?
(A) 6 (B) 5 (C) 4 (D) 3

14. How many times is number 5 followed by 1 or 2, but not preceded by 8 ?
(A) 4 (B) 5 (C) 6 (D) 7

15. **How many times is number 9 preceded by 1 and succeeded by 7 which is not followed by 5 ?**
(A) 3 (B) 4 (C) 5 (D) 6

16. Three persons A, B and C are standing in a queue. There are 5 persons in between A and B and eight persons between B and C.If there are 3 persons ahead of C and 21 persons behind A, what would be the minimum number of persons in the queue ?
[NTSE Stage-II,2009]
(A) 27 (B) 28 (C) 40 (D) 41

17. In a queue, Ramesh is the 7th from the back, Suresh is standing 6th from the front and only Shyam is standing in between the two. Find the minimum number of boys standing in the queue ?
[NTSE Stage-II,2011]
(A) 8 (B) 10 (C) 12 (D) 14

18. In a queue of 10 persons, A is standing on 7th from front and B is standing 6th from back. 3 persons entered the queue disrupting the positions of A and B. Find the pair of numbers indicating minimum possible disruption in their position from the front ?
[NTSE Stage-II,2011]
(A) 6, 10 (B) 6, 9
(C) 7, 10 (D) 7, 9

19. In the following how many times is rectangle preceded by a circle but following by a triangle?
[NTSE Stage-II,2011]

(A) 1 (C) 3 (B) 2 (D) 4

20. Which figure has been used most of the times?
[NTSE Stage-II,2011]

(A) ◯ (C) ◺ (B) ▭ (D) ▯

21. How many 6's are there in the following sequence which are followed by 3 and preceded by 8?
9 4 8 6 3 2 7 1 8 6 8 9 8 1 3 6 8 9 7 8 6 3 1 3 6 8 4 3 2 3 5
[NTSE Stage-I / Raj./2012]
(A) 2 (B) 3 (C) 4 (D) 5

22. In a dairy, there are 60 cows and buffalos. The number of cows is twice that of buffalos. Buffalo X ranked seventeenth in terms of milk delivered. If there are 9 cows ahead of Buffalo X, how many buffalos are after in rank in terms of milk delivered?
[NTSE Stage-II,2013]
(A) 10 (B) 11 (C) 12 (D) 13

23. Amongst five friends, Lata, Alka, Rani, Asha and Sadhana. Lata is older than only three of her friends. Alka is younger to Asha and Lata. Rani is older than only Sadhana. Who amongst them is the eldest?
[NTSE Stage-II,2013]
(A) Asha (B) Lata
(C) Alka (D) Sadhana

24. If the following numbers are written in ascending order, the sum of the digits of middle number will be
810, 912, 910, 809, 781, 673, 573
[NTSE Stage-I / Raj./2014]
(A) 9 (B) 12 (C) 17 (D) 13

25. How many 3s are there in the following figure series which are just preceded by 6 but not immediately followed by 7?
3 2 3 7 4 3 5 6 3 7 4 6 3 8 9 6 3 5 1 8 3 7 2 4 2 8 6 3 9 5
[NTSE Stage-I / Raj./2014]
(A) 1 (B) 2 (C) 3 (D) 4

26. If the following numbers are arranged in ascending order, then the multiplication of digits of the mid-number is -
719, 609, 735, 689, 834, 937, 600, 798, 610
[NTSE Stage-I/Raj. 2015]
(A) 96 (B) 9 (C) 17 (D) 63

27. If P > Q, Q > R and R > S, then P...?... S.
[NTSE Stage-I/Raj. 2015]
(A) P > S (B) P = S (C) P < S (D) P ≥ S

28. Urmila has 23rd rank from the right and 15th rank from the left. Then, how many persons are there in the row ?

[NTSE Stage-I/Raj. 2015]

(A) 37 (B) 38
(C) 9 (D) 8

29. How many 5s are there in the following sequence which are immediately followed by 3 but not immediately preceded by 7?

4 3 6 5 7 5 3 6 4 5 7 3 5 7 3 5 3

[NTSE Stage-I/Raj. 2017]

(A) 0 (B) 1
(C) 2 (D) 3

30. How many pairs of successive numbers have a difference of 2 in the following sequence ?

6, 4, 1, 2, 2, 8, 7, 4, 2, 7, 5, 3, 8, 6, 2, 1, 7, 0, 4, 1, 3, 2, 8, 6

[NTSE Stage-I/Raj. 2018]

(A) 4 (B) 5
(C) 6 (D) 7

Space for Notes :

Answer Key

EXERCISE–I														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	D	B	B	B	B	A	B	A	A	D	B	C	D	A
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
D	B	B	B	D	B	C	C	B	A	A	A	C	A	B
31	32													
D	B													

EXERCISE–II														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	C	A	C	C	B	B	A	A	B	A	B	C	B	B
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
B	B	B	A	A	A	C	A	C	C	D	A	A	B	B

SELF PROGRESS ASSESSMENT FRAMEWORK

(CHAPTER : NUMBER, RANKING & ORDERING TEST)

CONTENT	STATUS	DATE OF COMPLETION	SELF SIGNATURE
Theory			
In-Text Examples			
Solved Examples			
NCERT Exercises			
Exercise I			
Exercise II			
Short Note-1			
Revision - 1			
Revision - 2			
Revision - 3			
Remark			

NOTES :

1. In the status, put “completed” only when you have thoroughly worked through this particular section.

2. Always remember to put down the date of completion correctly. It will help you in future at the time of revision.

Space for Notes :

MATHEMATICAL OPERATIONS

5

INTRODUCTION

This section deals with questions on simple mathematical operations. Here, the four fundamental operations : addition, subtraction, multiplication and division and also statements such as 'less than', 'greater than', 'equal to', 'not equal to' etc. are represented by symbols, different from the usual ones. The questions involving these operations are set using artificial symbols. The candidate has to substitute the real signs and solve the question accordingly, to get the answer.

While attempting to solve a mathematical expression, proceed according to the rule BODMAS.

B Brackets - removal of brackets
O Of
D Division
M Multiplication
A Addition
S Subtraction

1. PROBLEM SOLVING BY SUBSTITUTION

In this type, you are provided with substitutes for various mathematical symbols, followed by a question involving calculation of an expression or choosing the correct / incorrect equation. The candidate is required to put in the real signs in the given equation and then solve the question as required.

Example 1

If '+' means'divided by' , '–' means 'multiplied by', '×' means 'minus' and '÷' means 'plus', which of the following will be the value of the expression $16 \div 8 - 4 + 2 \times 4$?

(A) 16 (B) 28 (C)32 (D) 44

Solution :

Using the proper signs in the given expression, we get:

$= 16 \div 8 - 4 + 2 \times 4$

$= 16 + 16 - 4$

$= 32 - 4 = 28.$

Hence, the answer is (B).

2. INTERCHANGE OF SIGNS AND NUMBERS

Example 2

If the given interchanges namely : signs + and ÷ and numbers 2 and 4 are made in signs and numbers, which one of the following four equations would be correct ?

(A) $2 + 4 \div 3 = 3$ (B) $4 + 2 \div 6 = 1.5$ (C) $4 \div 2 + 3 = 4$ (D) $2 + 4 \div 6 = 8$

Solution :

Interchanging + and ÷ and 2 and 4, we get:

(A) $4 \div 2 + 3 = 3$ or $5 = 3$, which is false. (B) $2 \div 4 + 6 = 1.5$ or $6.5 = 1.5$, which is false.

(C) $2 + 4 \div 3 = 2$ or $\frac{10}{3} = 2$, which is false (D) $4 \div 2 + 6 = 8$ or $8 = 8$, which is true.

Hence, the answer is (D).

3. DERIVING THE APPROPRIATE CONCLUSION

In these type of questions, certain relations between different sets of elements is given using either the real symbols or substituted symbols. You have to analyses the given statements and then decide which of the relations given as alternatives follows from those given in the statements.

Example 3

If A + B > C + D and B + C > A + D, then it is definite that

(A) D > B (B) C > D (C) A > D (D) B > D

Solution :

Given: A + B > C + D ..... (i)

and B + C > A + D .....(ii)

Adding (i) and (ii), we get;

(A + B) + (B + C) > (C + D) + (A + D)

$\Rightarrow$ A + 2B + C > C + 2D + A $\Rightarrow$ 2B > 2D $\Rightarrow$ B > D.

Hence, the answer is (D).

Example 4

In the following questions, the symbols @ © % ★ and $ are used with time following meanings as illustrated below:

'P @ Q' means 'P is either greater than or equal to Q';

'P © Q' means 'P is either smaller than or equal to Q';

'P % Q' means 'P is greater than Q';

'P ★ Q' means 'P is smaller than Q';

'P $ Q' means 'P is neither greater than nor smaller than Q'.

Now, in each of the following questions, assuming the given statements to be true, find which of the two conclusions I and II given below them is/are definitely true ?

Give answer (A) if only conclusion I is true ; (B) if only conclusion II is true, (C) if either conclusion I or II is true; (D) if neither I nor II is true; and (E) if both conclusions I and II are true.

1. Statement : M @ R, R % T, T $ K
   Conclusions : I. K ★ M II. T ★ M
2. Statements : H % J, B © J, B @ F
   Conclusions : I. F $ J II. J % F
3. Statement : D $ M, M % W, W @ R
   Conclusions : I. R ★ D II. W © D
4. Statement : A © N, N ★ V, V $ J
   Conclusions : I. J @ N II. A © V
5. Statements : K ★ T, T @ B, B © M
   Conclusions : I. M % T II. K © B
6. Statement : B @ H, H ★ M, M $ N
   Conclusions : I. B @ N II. N % H
7. Statement : W © R, J @ R, J ★ K
   Conclusions : I. J @ W II. K % R

Solution :

Clearly, we have:

(i) P @ Q $\Rightarrow$ P $\geq$ Q

(ii) P © Q $\Rightarrow$ P $\leq$ Q

(iii) P % Q $\Rightarrow$ P > Q

(iv) P ★ Q $\Rightarrow$ P < Q

(v) P $ Q $\Rightarrow$ P $\not>$ Q and P $\not<$ Q $\Rightarrow$ P = Q

1. Given statements : M $\geq$ R, R > T, T = K.

   (I) Relation between K and M:

   K = T, T < R, R $\leq$ M $\Rightarrow$ K < R $\leq$ M

   $\Rightarrow$ K < M i.e. K ★ M.

   (II) Relation between T and M.

   T < R, R $\leq$ M $\Rightarrow$ T < R $\leq$ M

   $\Rightarrow$ T < M i.e. T ★ M.

   so, both I and II are true. Hence, the answer is (E).

2. Given statements : H > J, B $\leq$ J, B $\geq$ F.

   Relation between F and J:

   B $\geq$ F, B $\leq$ J $\Rightarrow$ F $\leq$ B $\leq$ J $\Rightarrow$ F $\leq$ J

   $\Rightarrow$ F < J or F = J

   $\Rightarrow$ J > F or F = J i.e. J % F or F $ J.

   So, either I or II is true. Hence, the answer is (C).

3. Given statements : D = M, M > W, W $\geq$ R.

   (I) Relation between R and D :

   R $\leq$ W, W < M, M = D

   $\Rightarrow$ R $\leq$ W < M = D $\Rightarrow$ R < D i.e. R ★ D.

   (II) Relation between W and D:

   W < M, M = D $\Rightarrow$ W < M = D

   $\Rightarrow$ W < D i.e. W ★ D.

   so, only I is true while II is not. Hence, the answer is (A).

4. Given statement : A $\leq$ N, N < V, V = J

   (I) Relation between J and N:

   J = V, V > N $\Rightarrow$ J > N i.e. J % N.

   (II) Relation between A and V :

   A $\leq$ N, N < V $\Rightarrow$ A < V i.e. A ★ V.

   So, neither I nor II is true. Hence, the answer is (D).

5. Given statements : K < T, T $\geq$ B, B $\leq$ M.

   (I) Relation between M and T:

   M $\geq$ B, B $\leq$ T $\Rightarrow$ no definite conclusion.

   (II) Relation between K and B:

   K < T, T $\geq$ B no definite conclusion.

   So, neither I nor II is true. Hence, the answer is (D).

6. Given statements : $B \geq H$, $H < M$, $M = N$.
(I) Relation between B and N:
$B \geq H$, $H < M$, $M = N$
$\Rightarrow B \geq H < M = N \Rightarrow$ no definite conclusion.
(II) Relation between N and H :
$N = M$, $M > H \Rightarrow N > H$ i.e. N % H.
So, only II is true. Hence, the answer is (B).

7. Given statement : $W \leq R$, $J \geq R$, $J < K$.
(I) Relation between J and W:
$J \geq R$, $R \geq W \Rightarrow J \geq R \geq W$
$\Rightarrow J \geq W$ i.e. J @ W.
(II) Relation between K and R:
$K > J$, $J \geq R \Rightarrow K > J \geq R$
$\Rightarrow K > R$ i.e. K % R
So, both I and II are true. Hence, the answer is (E).

SOLVED EXAMPLES

PROBLEM SOLVING BY SUBSTITUTION

SE. 1

If + means ÷, – means ×; ÷ means + and × means –, then 36 × 12 + 4 ÷ 6 + 2 – 3 = ?

(A) 2 (B) 18

(C) 42 (D) $6\frac{1}{2}$

Ans. Using the proper signs, we get :

36 – 12 ÷ 4 + 6 ÷ 2 × 3

= 36 – 3 + 3 × 3

= 36 – 3 + 9 = 45 – 3 = 42.

Hence, the answer is (C).

SE. 2

If A means 'plus', B means 'minus', C means 'divided by' and D means 'multiplied by', then 18 A 12 C 6 D 2 B 5 = ?

(A) 15 (B) 25

(C) 27 (D) None of these.

Ans. Using the proper signs, we get :

Given expression = 18 + 12 ÷ 6 × 2 – 5

= 18 + 2 × 2 – 5 = 18 + 4 – 5 = 22 – 5 = 17

Hence, the answer is (D).

SE. 3

If × stands for –, ÷ stands for +, + stands for ÷ and – stands for ×, which one of the following equation is correct?

(A) 15 – 5 ÷ 5 × 20 + 10 = 6

(B) 8 ÷ 10 – 3 + 5 × 6 = 8

(C) 6 × 2 + 3 ÷ 12 – 3 = 15

(D) 3 ÷ 27 – 5 × 10 + 3 = 10

Ans. Using the proper signs, we get :

Expression in (A) = 15 × 5 + 5 – 20 ÷ 10

= 15 × 5 + 5 – 2 = 75 + 5 – 2 = 78

Expression in (B) = 8 + 10 × 3 ÷ 5 – 6

$= 8 + 10 \times \frac{3}{5} - 6 = 8 + 6 - 6 = 8$

Expression in (C) = 6 – 2 ÷ 3 + 12 × 3

$= 6 - \frac{2}{3} + 36 = 42 - \frac{2}{3} = \frac{124}{3}$

Expression in (D) = 3 + 27 × 5 – 10 ÷ 3

$= 3 + 27 \times 5 - \frac{10}{3} = 3 + 135 - \frac{10}{3} = \frac{104}{3}$

Hence, the answer is (B)

SE. 4

It is being given that > denotes +, < denotes –, + denotes ÷, – denotes =, = denotes 'less than' and × denotes 'greater than', find which of the following is a correct statement.

(A) 3 + 2 > 4 = 9 + 3 < 2

(B) 3 > 2 > 4 = 18 + 3 < 1

(C) 3 > 2 < 4 × 8 + 4 < 2

(D) 3 + 2 < 4 × 9 + 3 < 3

Ans. Using proper notations, we have :

(A) $3 \div 2 + 4 < 9 \div 3 - 2$ or $\frac{11}{2} < 1$, which is not true.

(B) $3 + 2 + 4 < 18 \div 3 - 1$ or $9 < 5$, which is not true.

(C) $3 + 2 - 4 > 8 \div 4 - 2$ or $1 > 0$, which is true.

(D) $3 \div 2 - 4 > 9 \div 3 - 3$ or $\frac{5}{2} > 0$, which is not true.

Hence, the answer is (C).

INTERCHANGE OF SIGNS AND NUMBERS

SE. 5

Which one of the four interchanges in signs and numbers would make the given equation 3 + 5 – 2 = 4 correct ?

(A) + and –, 2 and 3 (B) + and –, 2 and 5

(C) + and –, 3 and 5 (D) None of these.

Ans. By making the interchanges given in (C), we get the equation as 5 – 3 + 2 = 4 or, 4 = 4, which is true.

Hence, the answer is (C).

SE. 6

Given interchanges : signs – and ÷ and numbers 4 and 8 are made in signs and numbers, which one of the following four equations would be correct ?

(A) 6 – 8 ÷ 4 = –1 (B) 8 – 6 ÷ 4 = 1

(C) 4 ÷ 8 – 2 = 6 (D) 4 – 8 ÷ 6 = 2

Ans. On interchanging – and ÷ and 4 and 8 in (C), we get the equation as: 8 – 4 ÷ 2 = 6

or 8 – 2 = 6 or 6 = 6, which is true.

Hence, the answer is (C).

SE. 7

Given interchanges : Signs + and × and numbers 4 and 5 are made in signs and numbers, which one of the following four equations would be correct ?

(A) 5 × 4 + 20 = 40 (B) 5 × 4 + 20 = 85

(C) 5 × 4 + 20 = 104 (D) 5 × 4 + 20 = 95

Ans. On interchanging + and × and 4 and 5 in (C), we get the equation as : 4 + 5 × 20 = 104 or, 104 = 104, which is true.,

Hence, the answer is (C).

SE. 8

Which of the following two signs need to be interchanged to make the given equation correct?

10 + 10 ÷ 10 – 10 × 10 = 10

(A) + and – (B) + and ÷

(C) + and × (D) ÷ and +

Ans. On interchanging + and x in (C), we get the equation as :

10 × 10 ÷ 10 – 10 + 10 = 10

or 10 × 1 – 10 + 10 = 10

or 10 = 10, which is true.

Hence, the answer is (C).

SE. 9

Which of the following two signs need to be interchanged to make the given equation correct ?

2 × 3 + 6 – 12 ÷ 4 = 17

(A) × and + (B) + and –

(C) + and ÷ (D) – and ÷

Ans. On interchanging × and +, we get:

Given expression = 2 + 3 × 6 – 12 ÷ 4

= 2 + 3 × 6 – 3

= 2 + 18 – 3 = 17

Hence, the answer is (A).

DERIVING THE APPROPRIATE CONCLUSION

SE. 10

It being given that × denotes 'greater than', ϕ denotes 'equal' to', < denotes 'not less than', $\perp$ denotes 'not equal to', Δ denotes 'less than' and + denotes 'not greater than', choose. the correct statement from the following:

If a × b Δ c, it follow that

(A) a ϕ c Δ b (B) b < a × c

(C) a < b + c (D) c + b < a

(E) b < a ϕ c

Ans. Using the usual notations, we have :

(A) : The statement is a > b < c

$\Rightarrow$ a = c < b, which is false. [$\because$ c > b]

(B) : The statement is a > b < c

$\Rightarrow$ b $\not<$ a > c, which is false. [$\because$ b < a]

(C) : The statement is a > b < c

$\Rightarrow$ a $\not<$ b $\not>$ c, which is true.

(D) : The statement is a > b < c

$\Rightarrow$ c $\not>$ b $\not<$ c, which is false. [$\because$ b < a]

(E) : The statement is a > b < c

$\Rightarrow$ b $\not<$ a = c, which is false. [$\because$ b < a]

Hence, the statement (C) is true. Hence, the answer is (C).

SE. 11

USE. the following information :

X $\cup$ Y means divide X by Y

X $\uparrow$ Y means multiply X by Y

X # Y means subtract Y from X

X $\cap$ Y means add Y to X

One-fifth of one-tenth of two-third of a number X is given by :

(A) X $\uparrow$ (1 $\cup$ 5)$\uparrow$(1 $\cup$ 10)$\uparrow$(2 $\cup$ 3)

(B) X (1 $\uparrow$ 5)$\uparrow$(1 $\uparrow$ 10)$\uparrow$(2 $\cap$ 3)

(C) X (1 $\uparrow$ 5)$\uparrow$(1 $\uparrow$ 10)$\uparrow$(2 $\uparrow$ 3)

(D) can't be determined

Ans. X $\uparrow$ (1 $\cup$ 5) (1 $\cup$ 10) (2 $\cup$ 3)

$= X \times \frac{1}{5} \times \frac{1}{10} \times \frac{2}{3}$

Hence, the answer is (A).

SE. 12

What is the value of A if each letter represents a different digit ?

$$\begin{array}{r} A\,3\,B \\ \times\ B \\ \hline 2\,1\,7\,B \end{array}$$

(A) 3 (B) 4
(C) 5 (D) 7

Ans. In the following question the value of A and B are 4 and 5 respectively.

$$\begin{array}{r} 4\,3\,5 \\ \times\ 5 \\ \hline 2\,1\,7\,5 \end{array}$$

Hence, the answer is (B).

SE. 13

If 4 # 2 @ 3 = 6, 18 # 6 @ 4 = 12, then what will be the value to 24 # 3 @ 7 ?

(A) 21 (B) 27 (C) 72 (D) 56

Ans. Here, sign # implies division and sign @ implies multiplication $4 \div 2 \times 3 = 6$, $18 \div 6 \times 4 = 12$.
Therefore, $24 \div 3 \times 7 = 56$.
Hence, the answer is (D).

Space for Notes :

EXERCISE – I

MULTIPLE CHOICE QUESTIONS

1. The value of $(1001 \div 11) \div 13$ is :
(A) 7 (B) 91 (C) 143 (D) 169

2. The value of $\frac{(6+6+6+6)\div 6}{4+4+4+4\div 4}$ is equal to :
(A) 1 (B) $\frac{3}{2}$ (C) $\frac{4}{13}$ (D) $3\frac{6}{13}$

3. What mathematical operation should come at the place of '?' in the equation :
$2?6-12\div 4+2=11$
(A) + (B) – (C) × (D) ÷

4. If × means ÷, – means ×, ÷ means + and + means –, then $(3-15 \div 19) \times 8 + 6 = ?$
(A) 8 (B) 4 (C) 2 (D) –1

5. If 'a' means 'plus', 'b' means 'minus', 'c' means 'multiplied by' and 'd' means 'divided by' then 16c 12 b 6d 2a 17 = ?
(A) 65 (B) 55 (C) 216 (D) 206

6. If L denoted ÷, M denoted ×, P denoted + and Q denoted –, then which of the following statements is true ?
(A) 32 P8 L 16 Q 4 = $-\frac{3}{2}$
(B) 6 M 18 Q 26 L 13 P 7 = $\frac{173}{13}$
(C) 11M34 L 17 Q 8 L3 = $\frac{38}{3}$
(D) 9 P 9 L9 Q 9 M9 = –71

Directions (7 – 9) : Answer the questions on the basis of the information given below. If '$' represents '+', '÷' represents given '–', '#' represents '×' and '@' represents '÷' then answer the following questions based on the above given representation.

7. What is the value of 4 # 3 $ 10 @ 5 $ 8 # 2 ÷ 18 ?
(A) 10 (B) 12 (C) 6.8 (D) 11.2

8. Which of the following has the value equivalent of 5 $ 6 # 2 $ 8 @ 4 ?
(A) 4 # 7 ÷ 12 $ 2 # 1 (B) 8 # 2 ÷ 3 $ 6 @ 3
(C) 8 @ 2 ÷ 3 $ 6 # 3 (D) 4 $ 7 ÷ 12 $ 2 # 1

9. Which of the given values is greater than 7 $ 3 ÷ 2 $ 12 @ 4 ?
(A) 4 # 3 $ 6 @ 3 ÷ 4
(B) 5 # 2 ÷ 8 @ 4 $ 3 # 3 ÷ 7
(C) 6 # 3 ÷ 18 @ 2 $ 1# 2
(D) 9 @ 3 $ 6 # 2 ÷ 2 # 1

10. Find out the sign to be interchanged for making the given equation correct :
5 – 9 × 45 +15 ÷ 3 = 5
(A) + and – (B) × and +
(C) × and ÷ (D) × and –

11. Which one of the four interchanges in signs and number would make the given eqution correct ?
6 × 4 + 2 = 16
(A) + and ×, 2 and 4 (B) + and ×, 2 and 6
(C) + and ×, 4 and 6 (D) None of these

Directions (12 – 13) : For the following questions
□ means "bigger then"
Δ means "smaller then"
O means "equal to"
× means "addition"
= means "subtraction"

12. If a □ c and b × d O c, then
(A) d □ a (B) a O d
(C) b □ c (D) d Δ a

13. If a = b Δ d = c and a O c, then
(A) d □ b (B) d Δ b
(C) b O d (D) a □ d

Directions (14 – 15) : Some symbols are given below. These symbols denote some relationships between number
Δ = grater than
θ = equal to
□ = not less than
× = less than
+ = not greater than
ϕ = not equal to

14. a Δ b × c dose not mean :
(A) c □ b + a (B) b ϕ c ϕ a
(C) c Δ b × a (D) a ϕ b θ c

15. b □ c θ a means :
(A) a □ b □ c (B) c × b × a
(C) c Δ b Δ a (D) b □ a θ c

Directions (16 – 17) : The following symbol have been used
× stands for equal to
< stands for not equal to
– stands for greater than
+ stands for not greater than
> stands for less than
= stands for not less than

16. If p = q + r , than it is possible that –
(A) p × q – r (B) p + q – r
(C) p – q – r (D) p < q < r

17. If p > q × r, than it is possible that –
(A) p + q + r (B) p = r – q
(C) p × q + r (D) p = q – r

Directions (18 – 19) : In the following question find the relationship that can definitiely be deducted on the basis two relationship given. The symbols used are as follows :
⊔ means greater than, Δ means less than, – means not equal to, + means equal to

18. If 8A Δ 6B and 3B Δ 4C, therefore
(A) C ⊔ A (B) C Δ A
(C) 2C + A (D) C ⊔ 2A

19. If B ⊔ D, D Δ C, C ⊔ A and B + A, therefore
(A) C ⊔ B (B) C Δ B
(C) C – B (D) Can't be determined

20. In answering the questions below, use the following information :
X ∪ Y means divide X by Y
X ↑ Y means multiply X by Y
X # Y means subtract Y from X
X ∩ Y means add Y to X
A recevies X number of balls. He gives 10% of his ball to B, 15% of his ball to C and 12% of his ball to D. How many balls does he have with him now ?
(A) X ∩ X ↑ (10 ∪ 100) ∩ X ↑ (15 ∪ 100) # X ↑ (12 ∪ 100)
(B) X ∩ X ↑ (10 ↑ 100) ∩ X (15 ↑ 100) ∩ X ↑ (1 ↑ 100)
(C) X # [X ↑ (10 ∪ 100) ∩ X ↑ (15 ∪ 100) ∩ X ↑ (12 ∪ 100)]
(D) None of these

Directions (21 – 25) : In the following questions the symbols $, @, ⊂, ⊃ and ≠ are used with the following meaning.
A $ B means A is greater than B
A @ B means A is either greater than or equal to B
A ⊂ B means is A is equal to B
A ⊃ B means is A is smaller than B
A ≠ B means A is either smaller than or equal to B
Now is each of the following questions assuming the given statement to be true, find which of the two conclusions I and II given below them is/are definitely true ?
Give answer (A) if only conclusions I is true, (B) if only conclusion II is true (C) if neither I nor II is true (D) if both I and II are true.

21. **Statements :** P @ Q, M ≠ N, N ⊂ Q
Conclusions : I. P $ M II. N ≠ P

22. **Statements :** D ⊂ X, F @ Y, D $ F
Conclusions : I. X @ Y II. Y ≠ D

23. **Statements :** M ⊂ P, S $ T, M @ T
Conclusions : I. T ≠ P II. S ⊃ T

24. **Statements :** U ⊃ V, X $ W, U ⊃ W
Conclusions : I. W $ V II. U ⊂ X

25. **Statements :** G $ H, J ≠ K, H ⊂ K
Conclusions : I. G $ K II. J ⊂ K

Directions (26 – 30) : In the following questions the symbol @, $\underline{@}$, =, © and $\underline{©}$ are used with following meaning
P @ Q → P is greater than Q
P $\underline{@}$ Q → P is either greater or equal to Q
P © Q → P is smaller than Q
P $\underline{©}$ Q → P is either smaller than or equal to Q
P = Q → P is equal to Q.
Now in each of the following questions, assuming the given statement, to be true, find which of the two conclusion I and II given below them is/are definitely true.
Give answer (A) if only conclusion I is true, give answer (B) it only conclusion II is true, give answer (C) if either I or II is true, give answer (D) if both I and II are true.

26. **Statement :** B @ V, K © C, C $\underline{\underline{@}}$ B
Conclusions : I. V @ C II. B @ K

27. **Statement :** K @ T, S = K, T $\underline{\underline{©}}$ R
Conclusions : I. S @ R II. T = R

28. **Statement :** U = M, P $\underline{\underline{@}}$ U, M $\underline{\underline{@}}$ B
Conclusions : I. P = B II. P @ B

29. **Statement :** L $\underline{\underline{@}}$ N, J $\underline{\underline{©}}$ P, P $\underline{\underline{@}}$ L
Conclusions : I. J = L II. P =N.

30. **Statement :** H $\underline{\underline{@}}$ G, D @ E, H = E
Conclusions : I. D @ H II. G © D

31. In the correctly worked out multiplication problem at the below, each letter represent a different digit.
What is the value of B ?

$$\begin{array}{r} AA \\ \times\, AB \\ \hline BB \\ \hline AAX \\ \hline A3B \end{array}$$

(A) 1 (B) 2
(C) 4 (D) 5

Directions (32 – 34) : In the following questions find out the digits corresponding to the letter representing those digits in the multiplication give below.

$$\begin{array}{r} 9bc \\ \times\, 35d \\ \hline 3a4b \\ 4a35 \\ 2961 \\ \hline 34a39b \end{array}$$

32. b stands for :
(A) 6 (B) 7
(C) 8 (D) 9

33. c stands for :
(A) 7 (B) 6
(C) 5 (D) 4

34. d stands for :
(A) 2 (B) 3
(C) 4 (D) 5

35. What is the value of A if each letter represents a different digit ?

$$\begin{array}{r} A3B \\ \times\, B \\ \hline 217B \end{array}$$

(A) 3 (B) 4
(C) 5 (D) 7

36. Find the 4 digit number ABCD such that ABCD × 9 = DCBA.
(A) 1089 (B) 9801
(C) Both A and B (D) None of these

EXERCISE – II

MULTIPLE CHOICE QUESTIONS

Directions (1 – 2) : If the given interchanges are made in signs and numbers, then which one of the four equations would be correct?

1. Given interchanges signs '+' and '–', numbers '5' and '8'.
   (A) 82 – 35 + 55 = 2
   (B) 82 – 35 + 55 = 102
   (C) 85 – 38 + 85 = 132
   (D) 52 – 35 + 55 = 72
2. Given interchanges sings '+' and '×', numbers '3' and '7'.
   (A) 23 + 17 × 73 = 1241
   (B) 37 + 73 × 12 = 112
   (C) 23 × 17 + 37 = 428
   (D) 23 + 17 × 73 = 388
3. If ÷ means +, – means ÷, × means – and + means ×; then

$$\frac{(36\times 4)-8\times 4}{4+8\times 2+16\div 1}=?$$

   (A) 0 (B) 8 (C) 12 (D) 16
4. If × stands for 'add', y stands for 'subtract', z stands for 'divide and p stands for 'multiply', then what is the value of (7 p 3) y 6 × 5 ?
   (A) 5 (B) 10 (C) 15 (D) 20
5. If L denotes ×, M denotes ÷ , P denotes + and Q denotes –, then
   16 P 24 M 8 Q 6 M 2 L 3 = ?
   (A) $\frac{13}{6}$ (B) $-\frac{1}{6}$ (C) $14\frac{1}{2}$ (D) 10
6. If – means ÷, + means ×, ÷ means –, × means +, then which of the following equations is correct ?
   (A) 52 ÷ 4 + 5 × 8 – 2 = 36
   (B) 43 × 7 ÷ 5 + 4 – 8 = 25
   (C) 36 × 4 – 12 + 5 ÷ 3 = 420
   (D) 36 – 12 × 6 ÷ 3 + 4 = 60

Directions (7 – 8) : In each of the following questions if the given interchanges are made in signs and numbers, which one of the four equations would be correct ?

7. Given interchanges : Signs + and – and numbers 4 and 8
   (A) 4 ÷ 8 – 12 = 16 (B) 4 – 8 + 12 = 0
   (C) 8 ÷ 4 – 12 = 24 (D) 8 – 4 ÷12 = 8
8. Given interchanges : Signs – and × and numbers 3 and 6
   (A) 6 – 3 × 2 = 9 (B) 3 – 6 × 8 = 10
   (C) 6 × 3 – 4 = 15 (D) 3 × 6 – 4 = 33
9. Find out the two signs to be interchanged for making following equation correct :
   5 + 3 × 8 – 12 ÷ 4 = 3
   (A) + and –(B) – and ÷
   (C) + and ×(D) + and ÷
10. If α means 'greater than', β means 'equal to', θ means 'not less than', γ means 'less than', δ means 'not equal to' and η means 'not greater than', then which of the four alternatives could be a correct or proper inference for the expression :
    a α 2b and 2b θ r
    (A) a η r (B) a α r (C) a β r (D) a γ r
11. If A stands for 'not equal to' ($\neq$), B stands for 'greater than' (>), C stands for 'not less than' ($\not<$), D stands for 'equal to' (=), E stands for 'not greater than' ($\not>$), F stands for 'less than (<), then according to the given premises : 4x F 5y and 5y E 3s, then which of the following inferences is correct ?
    (A) 4x A 3s (B) 4x B 3s
    (C) 4x C 3s (D) 4x D 3s
12. If + means ÷, × means –, ÷ means × and – means +, then : 8 + 6 × 4 ÷ 3 – 4 ?
    (A) –12 (B) –20/3 (C) 12 (D) 20/3

Directions (13 – 16) : If > denotes +, < denotes –, + denotes ÷, $\wedge$ denotes ×, – denotes =, × denotes > and = denotes <, choose the correct statements in each of the following questions :

13. (A) 6 + 3 > 8 = 4 + 2 < 1
    (B) 4 > 6 + 2 × 32 + 4 < 1
    (C) 8 < 4 + 2 = 6 > 3
    (D) 14 + 7 > 3 = 6 + 3 > 2

14. (A) 14 > 18 + 9 = 16 + 4 < 1
(B) 4 > 3 ∧ 8 < I – 6 + 2 > 24
(C) 3 < 6 ∧ 4 > 25 = 8 + 4 < 1
(D) 12 > 9 + 3 < 6 × 25 + 5 > 6

15. (A) 29 < 18 + 6 = 36 + 6 ∧ 4
(B) 18 > 12 + 4 × 7 > 8 ∧ 2
(C) 32 > 6 + 2 = 6 < 7 ∧ 2
(D) 31 > 1 < 2 = 4 > 6 ∧ 7

16. (A) 7 > 7 < 7 + 7 = 14
(B) 7 ∧ 7 > 7 + 7 = 7 ∧ 7 > 1
(C) 7 < 7 + 7 = 6
(D) 7 + 7 > 7 = 8

Directions (17 – 19) : Given that : Δ denotes 'equal to'; □ denotes 'not equal to'; + denotes 'greater than'; – denotes 'less than', × denotes 'not greater than'; ÷ denotes 'not less than'. Choose the correct statement in each of the following questions :

17. a – b – c implies :
(A) a – b + c (B) b + a – c
(C) c × b + a (D) b + a ÷ c

18. a × b ÷ c implies :
(A) a – b + c (B) c × b ÷ a
(C) a □ b □ c (D) b ÷ a ÷ c

19. a + b + c does not imply :
(A) b – a + c (B) c – b – a
(C) c – a + b (D) b – a – c

20. If A stands for +, B stands for –,C stands for ×, then what is the value of :10 C 4 A 4 C 4 B 6 ?
(A) 60 (C) 56
(B) 50 (D) 46

Space for Notes :

EXERCISE – III

Directions (1 – 5) : In the following questions some letter stands for arithmetic sign as indicated below. The remaning letters have their serial number in the Alphabets. Decode the letter into number and sign to decide correct altenative–
A = ×, E = –, O = ÷, U = +

(NTSE Stage-I/Raj./2007)

1. TEF
(A) 14 (B) 12 (C) 16 (D) 18

2. SETUH
(A) 5 (B) 6 (C) 7 (D) 8

3. GULAB
(A) 26 (B) 28 (C) 31 (D) 38

4. NACED
(A) 32 (B) 36 (C) 39 (D) 38

5. RUFOBEG
(A) 14 (B) 16 (C) 12 (D) 18

Directions (6 –10) : In the following questions some numbers are given in the shape of figures. Finding the values of the figures given the correct answer of the questions.

(NTSE Stage-I/Raj./2008)

□ – △ = 1 ⬡ ÷ △ = 2

○ + △ = 3 □ – ○ = 4

6. □ = ?
(A) 0 (B) 3 (C) 4 (D) 6

7. ⬡ + △ = ?
(A) 5 (B) 7 (C) 8 (D) 9

8. □ × ○ = ?
(A) 0 (B) 3 (C) 5 (D) 6

9. □ × ⬡ ÷ △ = ?
(A) 3 (B) 6 (C) 8 (D) 24

10. ⬡ + □ – △ = ?
(A) 3 (B) 4 (C) 5 (D) 7

11. Given that ACT ÷ AT = 11, find out which of the following numbers dose not stand for CAT to fulfil
the above equation

(NTSE Stage-II/2011)

(A) 246 (B) 615
(C) 624 (D) 835

12. Given the following subtraction problem, find out which of the following number does not stand for CART.

(NTSE Stage-II/2011)

$$\begin{array}{r} CAR \\ ART \\ \hline 222 \end{array}$$

(A) 6420 (B) 7531
(C) 8420 (D) 9753

13. If '–' means 'multiplied by', '×' means 'plus', '+' means 'divided by' and ÷ means 'minus' than
14 – 10 × 4 ÷ 16 + 8 = ?

(NTSE Stage-II/2011)

(A) 142 (B) 134
(C) 6 (D) 5

14. If '+' means 'multiplied by', '–' means 'divided by', '×' means 'plus' and '÷' means 'minus' than
(18 + 10 × 20) – 8 ÷ 6 = ?

(NTSE Stage-II/2011)

(A) 92 (B) 35
(C) 19 (D) 26

15. If '+' means 'divided by', '–' means 'multiplied', '×' means 'plus' and '÷' means 'minus' than
(280 + 10 × 20) – 8 ÷ 6 = ?

(NTSE Stage-II/2011)

(A) 378 (B) 258
(C) 70 (D) 64

Directions (16 – 18) : The following questions are based on the given matrix. The value of each letter is the product of its row and column number e.g. the value of Z' is 3 × 4 = 12.

Columns

Row	0	1	2	3	4
0	B	O	J	C	P
1	E	N	H	I	D
2	G	R	A	M	V
3	F	S	T	L	Z
4	W	X	Y	U	K

Answer the following questions.

(NTSE Stage-II/2011)

16. Find the letters which make the least total among the alternatives.
(A) DKA (B) FHY (C) ODX (D) VTM

17. What is the total of GREAT ?
(A) 8 (B) 10 (C) 12 (D) 14

18. Find the letters which make the highest total among the alternatives.
(A) PLOT (B) PLAN (C) PLAY (D) PLUS

Directions (19 – 22) : In the following questions some relations are written by particular indicators as show below –
× = Greater than □ = Not less than
÷ = Not equal to ∅ = Equal to
+ = Not greater than △ = Less than
Find out the correct answer for each question.

(NTSE Stage-I/Raj./2012)

19. If x △ y ÷ z it is not possible –
(A) x ÷ y ∅ z (B) x + y × z
(C) x ÷ y × z (D) x △ y □ z

20. If x □ y □ z it is possible –
(A) x ∅ y ÷ z (B) x ÷ y + z
(C) x + y □ z (D) x + y △ z

21. If x ∅ y × z, it is possible –
(A) x × y △ z (B) x ∅ y + z
(C) x ∅ y □ z (D) x △ y ÷ z

22. If x ÷ y △ z, it is not possible –
(A) x × y + z (B) x ÷ y × z
(C) x □ y ÷ z (D) x + y + z

Directions (23 – 25) : In the following questions some relations are written by particular indicators as shown below –

(NTSE Stage-I/Raj./2013)

O = Greater than
+ = Equal to
△ = Not equal to
∅ = Not greater than
× = Not less than
□ = Less than
Find out the correct answer for each question.

23. If p △ q O r, it is possible that –
(A) p × q × r (B) p × q □ r
(C) p □ q ∅ r (D) p ∅ q ∅ r

24. If p □ q △ r, it is not possible that –
(A) p △ q ∅ r (B) p □ q △ r
(C) p ∅ q □ r (D) p + q × r

25. If p × q ∅ r, it is not possible that –
(A) p △ q □ r (B) p × q + r
(C) p △ q O r (D) p O q + r

26. If 27 ∗ 3 = 243 5 ∗ 4 = 80

(NTSE Stage-I/Raj./2013)

Then what is the value of 3 ∗ 7 ?
(A) 84 (B) 147
(C) 63 (D) 23

27. In this multiplication question the five letters represent five different digits. What are the actual figures ? There is no zero.

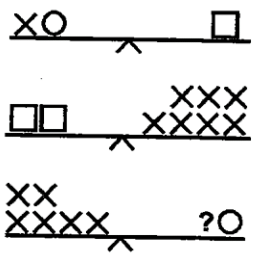
(NTSE Stage-II/2013)

SEAM
T
MEATS

(A) M = 3, E = 9, A = 7, T = 4, S = 8
(B) M = 3, E = 9, A = 7, T = 8, S = 4
(C) M = 4, E = 3, A = 9, T = 7, S = 8
(D) M = 4, E = 9, A = 3, T = 7, S = 8

28. Which symbol replaces the '?' Figure below represent a balance.

(NTSE Stage-II/2013)



(A) X (B) O (C) □ (D) □ O

29. If 23 ∗ 52 = 48, then 43 ∗ 35 = ?

(NTSE Stage-I/Raj./2014)

(A) 78 (B) 98 (C) 96 (D) 69

30. If 54/32 = 4, 36/42 = 3, 92/22 = 7 then what is 28/33 = ?

(NTSE Stage-II/2015)

(A) 5 (B) 6 (C) 4 (D) 9

31. If '<' means '–', '>' means '+', '=' means '×' and '$' means '÷', then what will be the value of 27 > 81 $ 9 < 6 ?
(NTSE Stage-I/Raj./ 2018)
(A) 6 (B) 36 (C) 30 (D) 54

32. If 20 ∗ 3 = 180 and 4 ∗ 5 = 100, then what is the value of 7 ∗ 7 ?
(NTSE Stage-I/Raj./ 2018)
(A) 21 (B) 49 (C) 343 (D) 7

33. If A > B, B > C and C > D, then which of the following conclusions is definitely wrong ?
(NTSE Stage-I/Raj./ 2019)
(A) A > C (B) A > D
(C) B > D (D) D > A

Directions (34–38): In each of the Question choose the correct alternative assuming α stands for '=' ; β stands for '>'; γ for '<' and δ for '≠'.
(NTSE Stage-I/Raj./ 2019)

34. If $6x \alpha 5y$ and $2y \beta 3z$, then
(A) $2x \beta 3z$ (B) $4x \beta 3z$
(C) $2x \gamma z$ (D) $4x \alpha 3z$

35. If $ax \gamma by$, $bx \alpha cz$ and $b^2 \alpha ac$, then
(A) $ax \beta cy$ (B) $ay \alpha cz$
(C) $y \gamma z$ (D) $y \beta z$

36. If $abxy \alpha c^2z$, $bx \beta ay$ and $b^2 \alpha ac$, then
(A) $ax^2 \beta cz$ (B) $a^2x^2 \beta cz$
(C) $b^2x \beta c^2z$ (D) $bx^2 \beta c^2z$

37. If $bcy \gamma ax$, $cy \alpha bz$ and $a^2 \gamma bc$, then
(A) $cx \alpha abz$ (B) $cx \gamma abz$
(C) $cx \delta abz$ (D) $c^2x \gamma a^2z$

38. If $a^2x \alpha byz$, $czx \alpha b^2y$ and $c^2z \alpha axy$, then
(A) $abc \alpha xyz$ (B) $abc \beta xyz$
(C) $abc \delta xyz$ (D) $abc \gamma xyz$

Space for Notes :

Answer Key

EXERCISE–I														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	C	C	C	D	D	B	C	D	D	C	D	A	D	D
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
D	A	A	A	C	B	C	A	C	A	B	B	C	D	A
31	32	33	34	35	36									
B	C	A	C	B	A									

EXERCISE–II														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	D	A	D	D	A	B	B	B	B	A	B	C	B	D
16	17	18	19	20										
A	B	B	D	B										

EXERCISE–III														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	C	C	D	A	C	D	A	C	D	A	C	A	C	A
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
C	C	D	A	A	C	B	A	D	C	B	B	C	C	C
31	32	33	34	35	36	37	38							
C	C	D	B	D	A	C	A							

SELF PROGRESS ASSESSMENT FRAMEWORK

(CHAPTER : MATHEMATICAL OPERATIONS)

CONTENT	STATUS	DATE OF COMPLETION	SELF SIGNATURE
Theory			
In-Text Examples			
Solved Examples			
Exercise I			
Exercise II			
Exercise III			
Short Note-1			
Revision - 1			
Revision - 2			
Revision - 3			
Remark			

NOTES :

1. In the status, put “completed” only when you have thoroughly worked through this particular section.
2. Always remember to put down the date of completion correctly. It will help you in future at the time of revision.

Space for Notes :

ALPHA-NUMERIC SEQUENCE PUZZLE

6

INTRODUCTION

In these type of questions a jumbled sequence of some letters, numbers and symbols is given and the candidate is required to find out how many times a number or a letter or a symbol satisfying the conditions, specified in the question occurs.

SOLVED EXAMPLES

Direction (1 – 9) : Study the following arrangement of symbols, letters and numbers to answer the questions given below it :

δ = β F 2 ★ K S 7 5 # $ P L V 8 @ M U E 6 ↑ Q G © 9 3 & T Y %

SE. 1

How many such letters are there in the arrangment each of which is either immediately preceded by a symbol or immediately followed by a number, but not both ?

(A) Three (B) Four

(C) Five (D) None of these

Ans. The letters satisfying the given conditions are shown as under :

δ = β F 2 ★ **K** **S** 7 5 # $ **P** L **V** 8 @ **M** U **E** 6 ↑ **Q** G © 9 3 & **T** Y %

Clearly, there are 8 such letters. Hence, the answer is (D).

SE. 2

How many such consonants are there in the above arrangement each of which is immediately followed by a consonant but not immediately preceded by a symbol ?

(A) Nil (B) One

(C) Two (D) Three

Ans. We know that of the 26 letters of English alphabet, five letters namely A, E, I, O, U are vowels, while remaining are consonants. The consonants satisfying the given conditions may be shown as under :

δ = β F 2 ★ K S 7 5 # $ P **L** V 8 @ M U E 6 ↑ Q G © 9 3 & T Y %

Clearly, there is only one such consonant. Hence, the answer is (B).

SE. 3

Which of the following is exactly in the middle of the ninth from the left end and the fifteenth from the right end in the above arrangement?

(A) P (B) U

(C) E (D) L

Ans. Clearly, counting from the left, the ninth element is 7. Counting from the right, the fifteenth element is @. The character midway between 7 and @ is P. Hence, the answer is (A).

SE. 4

If all the elements after the middle element in the above arrangement are written in the reverse order, which of the following will be seventh towards right of the twelfth element from the left end?

(A) U (B) 2

(C) T (D) 6

Ans. The middle element in the given arrangement is 8. Writing all the elements after 8 in the reverse order, we get the following sequence:

δ = β F 2 ★ K S 7 5 # $ P L V 8 % Y T & 3 9 © G Q ↑ 6 E U M @

Counting from the left in the above sequence, the twelfth element is $. The seventh element to the right of $ is T. Hence, the answer is (C).

SE. 5

What should come in place of the question mark in the following series based on the above arrangement?

β 2 S 5 $ V @ U ↑ ?

(A) Q © & (B) G 9 T

(C) Q 9 $ (D) None of these

Ans. Observing the elements of the series in the given arrangement, we find that all the three letters of each term move seven steps forward to give the corresponding letters of the next term. The element 7 steps ahead of

(i) @ is G; (ii) U is 9;

(iii) ↑ is T.

Thus, the missing term is G 9 T. Hence, the answer is (B).

SE. 6

Which of the following groups of elements will come in place of the question mark in the series of elements given below

K 2 δ 5 S F P # K ? U @ P

(A) 8 L 5 (B) @ V #

(C) V P 7 (D) 8 $ 5

Ans. Clearly, first and second elements of each term move two steps and four steps backward respectively to give the second and third elements of the same term. The third element of each term moves nine steps forward to give the first element of the next term. The pattern is repeated in the subsequent terms.

Now, the letter 9 steps ahead of K is 8; the letter 2 steps behind 8 is L and the letter 4 steps behind L is 5. Thus, the missing term is 8 L 5. Hence, the answer is (A).

SE. 7

Three of the following four are alike in a certain way based on their position in the above arrangement and so form a group. Which is the one that does not belong to the group?

(A) 7 # K (B) U 6 @

(C) & Y 9 (D) S # 2

Ans. On careful observation, we find that in all other groups except (D), the first element moves 2 steps forward to give the second element which in turn moves 4 steps backward to give the third element. But in (D), the first element moves 3 steps forward to give the second element while the second element moves 6 steps backward to give the third element. Hence, the answer is (D).

SE. 8

Three of the following four are alike on the basis of their position in the given arrangement and hence form a group. Which of the following does not belong to that group?

(A) F K & (B) L @ M

(C) β ★ T (D) $ V ↑

Ans. Clearly, in all other groups except (D), the first element moves 3 steps forward to give the second element, while the third element occupies the same position from the right as the first element occupies from the left in the given arrangement. Now, the element 3 steps ahead of $ is V. Also, $ is 12th element from the left end in the given arrangement. We find that the 12th element from the right end is E. Thus, the correct group in (D) should be $ V E. Hence, the answer is (D).

SE. 9

Based on the positions in the above arrangement, if β F δ : T & £, then K ★ 7 : ?

(A) © 9 Q (B) © G Q

(C) 9 © Q (D) © 9 ↑

Ans. Observing the given analogous pair, we find that the corresponding elements of both the terms occupy the same position from the beginning and end of the given arrangement.

Now, K, ★ and 7 are respectively 7th, 6th and 9th elements from the left end in the given arrangement. The 7th, 6th and 9th elements from the right end are ©, 9 and Q respectively.

Thus, the missing term is © 9 Q.

Hence, the answer is (A).

EXERCISE – I

MULTIPLE CHOICE QUESTIONS

Directions (1 – 5) : Study the following arrangement carefully and answer the questions given below:

R E 5 D A P $ 3 T I Q 7 9 B # 2 K % U 1 M W 4 ★ J 8 N

1. Which of the following is exactly in the middle between 3 and 1 in the above arrangement?
(A) B (B) K (C) 9 (D) #

2. How many such numbers are there in the above arrangement, each of which is immediately preceded by a consonant and not immediately followed by a consonant?
(A) None (B) One (C) Two (D) Three

3. How many such vowels are there in the above arrangement, each of which is immediately followed by a number but not immediately preceded by a consonant?
(A) None (B) One (C) Two (D) Three

4. Which of the following is seventh to the left of the sixteenth from the left in the above arrangement?
(A) A (B) U (C) 4 (D) T

5. Three of the following four are alike in a certain way based on their position in the above arrangement and so from a group. Which is the one that does not belong to that group?
(A) B K 7 (B) M ★ U
(C) D P E (D) W J 1

Directions (6 –10) : Study the following arrangement carefully and answer the questions given below:

8 C M @ N £ T 2 Y 6 S α Q $ 7 ★ W # Z 3 U E % A 4

6. How many symbols are there in the above series, which of the following would be the eighth element to the right of the thirteenth element from the left end?
(A) Nil (B) One (C) Two (D) Three

7. If all the vowels are dropped from the above series, which of the following would be the eighth element to the right of the thirteenth element from the left end?
(A) 4 (B) 8 (C) % (D) C

8. If each symbol is first converted into a numeral and then all the numerals are converted into English letters, how many converted English letters will be there in the above arrangement of elements?
(A) 7 (B) 12 (C) 13 (D) 25

9. What should come in place of the question mark in the following series based on the above arrangement?
C M A N £ E 2 Y 3 ? $ 7 ★
(A) £ Q # (B) S α #
(C) S 6 α (D) S α Z

10. Three of the following four are alike in a certain way with respect to their position in the above arrangement. Which is the one that is different from the other three?
(A) £ 2 6 (B) Q 7 W
(C) # 3 E (D) T M N

Directions (11 – 15) : These questions are based on the following arrangement:

J Y 2 = S £ ξ E G M ⌘ 7 $ H P 9 K L β @ W Q 1 3 # C D ©

11. How many such symbols are there in the above arrangement each of which is either immediately followed by a number or immediately preceded by a letter, but not both?
(A) Nil (B) One
(C) Two (D) Three

12. How many such letters are there in the above arrangement each of which is either immediately followed by a number or immediately preceded by a letter, but not both?
(A) Four (B) Five
(C) Six (D) None of these

13. How many such numbers are there each of which is either immediately followed by a symbol or immediately preceded by a letter, but not both?
(A) Two (B) Three (C) Four (D) Five

14. Three of the following four are alike in a certain way based on the position of the elements in the above arrangement and hence from a group. Which one does not belong to the group?
(A) 2 Y C D (B) £ S 1 3
(C) J S © 3 (D) = # 2 C

15. 2 Y S is to E G £ in the same way as P H K is to?
(A) W Q B (B) @ W L
(C) @ β Q (D) @ W K

Directions (16 – 20) : Study the following arrangement carefully and answer the questions given below:
W 1 U % 4 J A # 7 M T 2 I 9 B H 3 E $ 9 F Q 5 D G 6 R S P

16. Which of the following is the seventh to the right of the eighteenth from the right end?
(A) E (B) E (C) $ (D) #

17. If the order of the last fifteen elements is reversed, which of the following will be fifth to the right of 12th from the left and?
(A) U (B) $ (C) 3 (D) 6

18. Three of the following four are alike in a certain way on the basis of above arrangement and hence form a group. Which one does not belong to that group?
(A) R W 4 (B) 5 F G
(C) 9 Q A (D) 3 B $

19. If the positions of E and A are interchanged and similary the position of R and U are interchanged then how many symbols will be there each of which is either preceded or followed by a vowel?
(A) None (B) One
(C) Two (D) Three

20. What sould come in place of question mark on the basis of the above arrangement?
R 4 # M 2 B 3 $ Q ?
(A) 5 G U (B) D 6 S
(C) 5 G S (D) D 6 P

Directions (21 – 24) : Study the following arrangement of letters, digits and symbol to answer the questions given below:
P B 7 C D 9 Z Y ★ A 2 M © K S 3 ↑ 5 N T @

21. Which of the following letters is exactly midway between only letters falling between C and 5?
(A) K (B) M
(C) P (D) None of these

22. If each symbol of the above sequence is replaced with a letter and each digit is replaced with new symbol, then how many letters will be there in the sequence?
(A) 4 (B) 12
(C) 16 (D) 17

23. If the first element from the left interchange place with the tenth element from the left, similary second with ninth, third with eight, fourth with seventh and so on, then which of the following will be seventh to the left of eighth element from the right?
(A) C (B) D (C) 7 (D) 9

24. How many such digits are there in the sequence each of which is immediately preceded as well as followed by a letter?
(A) Nil (B) One (C) Two (D) Three

EXERCISE – II

MULTIPLE CHOICE QUESTIONS

Directions (1 – 6) : These questions are based on the following arrangement of symbols, letter and number:

↑ 9 B Q = $ 2 5 R J ∂ L 3 @ Y M E 6 8 ★ ÷ D F 4 β H 7 ©

1. How many such numbers are there in the arrangement each of which is immediately preceded by a symbol but not immediately followed by a letter?
(A) Nil (B) One (C) Two (D) Three

2. Three of the following four are alike in a certain way on the based on the position of the elements in the above arrangement and hence form a group. Which one does not belong to that group?
(A) ★ ÷ 8 D 6 (B) Y M @ E 3
(C) @ Y 3 M L (D) β H 4 7 D

3. How many such symbols are there in the arrangement each of which is either immediately followed by a number or immediately preceded by a letter?
(A) One (B) Two (C) Three (D) Four

4. Total number of pairs of adjacent symbol and letter (X), total number of pairs of adjacent letter and number (Y) and total number of pairs of adjacent number and symbol (Z) in the above arrangement are written in the descending order. Which of the following will indicate the same?
(A) X, Y, Z
(B) X, Z, Y
(C) Y, X, Z
(D) All the three are equal in number

5. How many such letters are there in the arrangement each of which is immediately followed by a number but not immediately preceded by a symbol?
(A) Nil (B) One (C) Two (D) Three

6. In the above arrangement, 2 R J L : B = $ 5 and Y E 6 ★ : ∂ 3 @ M in the same way as ? : 8 ÷ D 4
(A) D 4 β © (B) F β H ©
(C) D 4 β 7 (D) ÷ F 4 H

Directions (7 – 11) : Study the following digit, letter, symbol sequence carefully and answer the questions given below:

R ★ T J L 2 $ D = M # 8 C % B < K 1 & A W ? P E + Q @ 7 F 6

7. How many such numbers are there in the above sequence, each of which is immediately preceded by a consonant and immediately followed by a symbol?
(A) One (B) Two (C) Three (D) Four

8. Which of the following is sixth to the left of eighteenth element from the left?
(A) % (B) C (C) 1 (D) 8

9. If the above sequence is written in reverse order then which of the following will be sixth to the right of sixteenth element from the right end?
(A) M (B) A (C) B (D) ?

10. If the first elements in the above sequence are written in reverse order then which of the following will be twenty-first from the right end?
(A) 2 (B) $ (C) = (D) L

11. What should come in place of question mark in the following on the basis of above sequence?
★ R J : F 6 @
L J $: Q @ E
D $ M : ?
(A) # M C (B) P E W
(C) P ? + (D) P E ?

Directions (12 – 16) : Study the following series of alpha-numeric – symbol combination and answer the questions that follow:

S K 6 £ Q 2 R ★ C F 8 E $ G 2 # 4 9 L N 3 U V 5 Y α B 7 W 9

12. How many symbols are there in the above arrangement each of which is immediately preceded by but not immediately followed by a letter of English alphabet?
(A) Nil (B) One (C) Two (D) Three

13. What should come in place of question mark in the following series?
S 9 K 6 W £ Q 7 2 ? C α F
(A) R Y ★ (B) ★ Y C
(C) 2 B R (D) R B ★

14. If the positions of # and $ are interchanged, so also the positions of £ and ★ ,Q and K and F and V are interchanged, which of the following will be the ninth element to the left of eighteenth element from the left?
(A) C (B) V (C) 8 (D) ★

15. Three of the following four are alike in respect of their positions in the above series. Which is the one that does not belong to that group?
(A) Q ★ 8 (B) £ R F
(C) 6 2 C (D) 2 ★ 8

16. S K £ is related to 9 W B in the same way as Q 2 ★ is related to
(A) α V U (B) α Y 5
(C) 7 B Y (D) α Y V

Directions (17 – 21) : Study the following letter-number sequence to answer the questions:
E & G B D M 4 N K H 2 A C Z S V 3 F 1 J L O Q 5 P R

17. If it is possible to make a meaningful word with the first, the twelfth, the fifteenth and the twenty-first letters, then which of the following will be the first letter of that word? If no such word can be made, give X as your answer and if more than one such words can be made, give M as your answer:
(A) E (B) T (C) X (D) M

18. What will come in place of question mark in the following sequence?
G D R B M P D 4 5 ?
(A) M N Q (B) 4 N Q
(C) M K O (D) M 4 Q

19. If the letters/numbers only from M to L are written in the reverse order and other letters/numbers are kept unaltered, then which letter will be the third to the right of 17th letter/number from the right?
(A) A (B) C (C) S (D) Z

20. If every third letter/number starting from the right replaces successive days of the week starting from Monday, then which letter will replace Thursday?
(A) A (B) F (C) S (D) Z

21. If every alternate letters/number is dropped starting from E onwards, then which letter/number will be the second to the left of the tenth letter/number from the left?
(A) A (B) B (C) Q (D) V

Directions (22 – 26) : Study the following arrangement carefully to answer these questions:
M 1 E $ R B 3 A K 7 £ # 9 $ U D I N 4 6 % F H 2 @ 8 W

22. How many such consonants are there in the above sequence, each of which is immediately followed by a number and immediately preceded by a vowel?
(A) Nil (B) One (C) Two (D) Three

23. Three of the following four are alike in a certain way and so form a group, based on the above arrangement. Which is the one belong to that group?
(A) % H N (B) I 4 $
(C) 9 D £ (D) 3 K $

24. How many such vowels are there in the above arrangement, each of which is immediately preceded by a symbol and immediately followed by a consonant?
(A) Nil (B) One
(C) Two (D) Three

25. If the order of first fifteen elements in the above arrangement is reversed, then which of the following will be the eighth to the left twelfth letter/number/symbol from the right end?
(A) A (B) £ (C) 3 (D) K

26. What should come in place of question mark in the following series based on the above arrangement?
E B M A £ B 9 D £ ? H 8 %
(A) N % D (B) N F D
(C) 4 F D (D) I 6 D

Answer Key

EXERCISE–I														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	C	B	D	C	D	C	C	B	D	C	A	C	D	B
16	17	18	19	20	21	22	23	24						
C	A	C	D	D	C	C	A	D						

EXERCISE–II														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	D	D	D	C	B	D	D	A	A	B	A	D	A	D
16	17	18	19	20	21	22	23	24	25	26				
D	D	A	D	C	D	C	C	B	A	A				

SELF PROGRESS ASSESSMENT FRAMEWORK

(CHAPTER : ALPHA NUMERIC SEQUENCE PUZZLE)

CONTENT	STATUS	DATE OF COMPLETION	SELF SIGNATURE
Theory			
In-Text Examples			
Solved Examples			
Exercise I			
Exercise II			
Short Note-1			
Revision - 1			
Revision - 2			
Revision - 3			
Remark			

NOTES :

1. In the status, put "completed" only when you have thoroughly worked through this particular section.
2. Always remember to put down the date of completion correctly. It will help you in future at the time of revision.

Space for Notes :