

NTSE_Stage1_TN_2018_MAT – Solutions

1. Ans: 3

$$\begin{array}{cccccc}
 19, & 24, & 31, & 42, & 55, & 72, & \underline{\quad} \\
 \hline
 & +5 & +7 & +11 & +13 & +17 & +19 \\
 \hline
 & & & & & & 72+19=91
 \end{array}$$

2. Ans: 2

$$\begin{array}{ccccc}
 10, & 58, & 105, & \underline{\quad} & 196, & 240, \\
 \hline
 & +48 & +47 & +46 & +45 & +44 \\
 \hline
 & & & & & 105+46=151
 \end{array}$$

3. Ans: 1

$$\begin{array}{cccc}
 Z, & W, & R, & K \\
 26 & 23 & 18 & 11 \\
 \hline
 & -3 & -5 & -7 \\
 \hline
 & & & 11-9=2-B
 \end{array}$$

4. Ans: 2

$$\begin{array}{cccccc}
 1, & 4, & 13, & 40, & 121, & \underline{\quad} \\
 \hline
 & +3 & +9 & +27 & +81 & +243 \\
 \hline
 & & & & & 121+243=364
 \end{array}$$

5. Sol: 0, 1, 2, 3, 6, 11, 20, _____

$$0 + 1 + 2 = 3$$

$$2 + 3 + 6 = 11$$

$$3 + 6 + 11 = 20$$

$$6 + 11 + 20 = 37$$

ANS: (3)

6. Sol: 6, 10, 16, 26, 42, 68

$$7 \quad 8 \quad 15 \quad 23 \quad 38$$

$$7 + 8 = 15$$

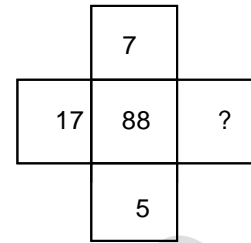
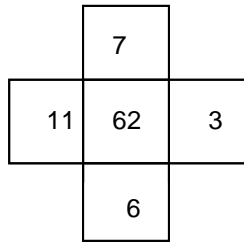
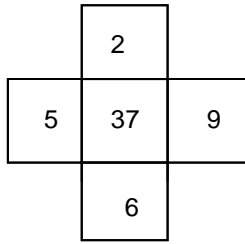
$$8 + 15 = 23$$

$$15 + 23 = 38$$

$$23 + 38 = 61$$

Ans (1)

7. Sol :



$$5 \times 6 + (9 - 2) = 37$$

$$6 \times 11 + (3 - 7) = 62$$

$$17 \times 5 + x - 7 = 88$$

$$x = 10$$

ANS : (4)

8.

Sol : Pen is for writing cycle is for riding

ANS: (3)

9.

Sol : Eye is part of face in the same way knob is part of door.

ANS: (3)

10.

Sol : Wing and Beak are parts of a bird. Pluto and Venus the parts of solar system.

ANS: (2)

11.

Sol : Room is a part of house in the same way roof is a part of building

ANS: (3)

12.

Sol : 5 : 29 :: _____ : 41

$$(5 \times 6) - 1 = 29$$

$$(5 \times 6) - 1 = 29$$

$$(6 \times 7) - 1 = 41$$

$$(7 \times 6) - 1 = 41$$

ANS : (2 / 3)

13.

Sol : Canada currency is dollar in the same way Germany currency is Deutscho Mark

ANS: (3)

14.

Sol : Potato has carbohydrate, in the same way Ghee has fat.

ANS: (4)

15.

Sol : Davis cup is played for Lawn Tennis, in the same way Deodar Trophy is played for cricket

ANS: (2)

16. Sol : $1001 = 7 \times 11 \times 13$
 $2431 = 11 \times 13 \times 17$
 ANS: (1)

17. Sol : $132 - 62 = 70$
 $237 - 132 = 105$
 $237 - 62 = 175$
 HCF = 35
 ANS : (2)

18. Sol: The LCM of 48, 72, 108 is 432, so they strike again in 432 sec = 7 min 12 sec.
 ANS: (3)

19. Sol: Total wrong question = $2x$
 Total correct questions = x .
 \Rightarrow Total questions = $60 = 3x$
 $\Rightarrow x = 20$
 Ans (4)

20.
$$\frac{1}{5 \times 6} + \frac{1}{6 \times 7} + \frac{1}{7 \times 8} + \dots + \frac{1}{24 \times 25}$$

$$\frac{1}{5 \times 6} = \frac{6-5}{5 \times 6} = \frac{6}{5 \times 6} - \frac{5}{5 \times 6} = \frac{1}{5} - \frac{1}{6}$$

$$\Rightarrow \frac{1}{5} - \frac{1}{6} + \frac{1}{6} - \frac{1}{7} + \dots + \frac{1}{24} - \frac{1}{25}$$
 everything cancels except

$$\frac{1}{5} - \frac{1}{25}$$

$$= \frac{5-1}{25} = \frac{4}{25} = 0.16$$
 Ans (2)

21.2

1

$$\frac{2x}{1 + \frac{1}{1 + \frac{1}{1-x}}} = 3$$

$$\Rightarrow \frac{2x}{1 + \frac{1}{\frac{1-x+x}{1-x}}} = 3$$

$$\Rightarrow \frac{2x}{1+1-x} = 3$$

$$\Rightarrow \frac{2x}{2-x} = 3$$

$$\Rightarrow 2x = 3(2-x)$$

$$\Rightarrow 2x = 6 - 3x$$

$$5x = 6$$

$$\therefore x = 6/5$$

\therefore Ans(2)

22.22.

$$\text{Given } 36 \div 18 \div 9 - 3 \times 26$$

$$36 \div 18 - 9 \times 3 + 26$$

$$\Rightarrow 2 - 27 + 26$$

$$\Rightarrow 2 - 1 = 1$$

ANS : (D)

23.

Let total number of children = x

And number of books distributed to each child is y

\Rightarrow Total no of books = xy.

By the sum, $y = \frac{1}{8}x$ _____ (1)

and $\frac{1}{2}x \times 16 = xy$

$$\Rightarrow y = 8$$

$$\Rightarrow x = 64$$

\therefore Total number of note books distributed is $64 \times 8 = 512$

ANS : (A)

24. 2

4

$$x = \frac{\sqrt{5} + \sqrt{4}}{\sqrt{5} - \sqrt{4}}$$

$$x = \frac{\sqrt{5} + \sqrt{4}}{\sqrt{5} - \sqrt{4}} \times \frac{\sqrt{5} + \sqrt{4}}{\sqrt{5} + \sqrt{4}}$$

$$x = \frac{(\sqrt{5} + \sqrt{4})^2}{1} = 5 + 4 + 2\sqrt{20}$$

$$x = 9 + 2\sqrt{20}$$

$$y = \frac{\sqrt{5} - \sqrt{4}}{\sqrt{5} + \sqrt{4}} \times \frac{\sqrt{5} - \sqrt{4}}{\sqrt{5} - \sqrt{4}} = (5 - \sqrt{4})^2$$

$$y = 5 + 4 - 2\sqrt{20} = 9 - 2\sqrt{20}$$

$$x^2 + y^2 = (9 + 2\sqrt{20})^2 + (9 - \sqrt{20})^2$$

$$= 2(9^2 + (2\sqrt{20})^2) = 2(81 + 4 \times 20)$$

$$= 2(81 + 80)$$

$$= 2(161)$$

$$= 322$$

ANS : (A)

25. 25.

$$\sqrt{1.3} + \sqrt{1300} + \sqrt{0.013}$$

$$\frac{\sqrt{1.3 \times 100}}{\sqrt{100}} + \sqrt{13} \times \sqrt{100} + \frac{\sqrt{0.013 \times 10000}}{\sqrt{10000}}$$

$$\frac{\sqrt{130}}{10} + \sqrt{13} \times 10 + \frac{\sqrt{130}}{100}$$

$$\frac{11.40}{10} + (3.605) \times 10 + \frac{11.40}{100}$$

$$= 1.14 + 36.05 + 0.114$$

$$= 37.304$$

ANS : (4)

26.

$$\frac{1}{\sqrt{9}-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-\sqrt{4}}$$

Rationalizing the denominator

$$\frac{1}{\sqrt{9}-\sqrt{8}} \times \frac{\sqrt{9}+\sqrt{8}}{\sqrt{9}+\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} \times \frac{\sqrt{8}+\sqrt{7}}{\sqrt{8}+\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} \times \frac{\sqrt{7}+\sqrt{6}}{\sqrt{7}+\sqrt{6}}$$

$$= \frac{1}{\sqrt{6}-\sqrt{5}} \times \frac{\sqrt{6}+\sqrt{5}}{\sqrt{6}+\sqrt{5}} + \frac{1}{\sqrt{5}-\sqrt{4}} \times \frac{\sqrt{5}+\sqrt{4}}{\sqrt{5}+\sqrt{4}}$$

$$= (\sqrt{9} + \sqrt{8}) - (\sqrt{8} + \sqrt{7}) + (\sqrt{7} + \sqrt{6}) - (\sqrt{6} + \sqrt{5}) + (\sqrt{5} + \sqrt{4})$$

$$= 3 + \cancel{\sqrt{8}} - \cancel{\sqrt{8}} - \cancel{\sqrt{7}} + \cancel{\sqrt{7}} + \cancel{\sqrt{6}} - \cancel{\sqrt{6}} - \cancel{\sqrt{5}} + \cancel{\sqrt{5}} + 2$$

$$= 3 + 2 = 5$$

= option (2)

27.

$$\sqrt{\frac{(0.03)^2(0.21)^2 + (0.065)^2}{(0.003)^2 + (0.021)^2 + (0.0065)^2}}$$

$$= \sqrt{\frac{(3 \times 10^{-2})^2 + (21 \times 10^{-2})^2 + (65 \times 10^{-3})^2}{(3 \times 10^{-3})^2 + (21 \times 10^{-3})^2 + (65 \times 10^{-4})^2}}$$

$$= \sqrt{\frac{9 \times 10^{-4} + (21)^2 \times 10^{-4} + (65)^2 \times 10^{-6}}{9 \times 10^{-6} + (21)^2 \times 10^{-6} + (65)^2 \times 10^{-8}}}$$

$$= \sqrt{\frac{(9 \times (21)^2 \times (65)^2 \times 10^{-2}) \times 10^{-4}}{(9 \times (21)^2 + (65)^2 \times 10^{-2}) \times 10^{-6}}}$$

$$= \sqrt{\frac{10^{-4}}{10^{-6}}}$$

$$= \sqrt{10^{-4+6}}$$

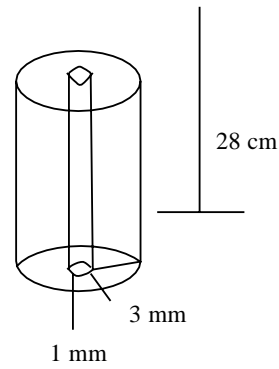
$$= \sqrt{10^2} = 10$$

∴ ANS : (3)

28. Volume of wood used in

$$\begin{aligned}
 &= \pi(R^2 - r^2) \times h \\
 &= \pi(R+r)(R-r) \times h \\
 &= \frac{22}{7} \times 0.4 \times 0.2 \times 28 \\
 &= 7.04\text{cm}^3
 \end{aligned}$$

Ans: B



$$\begin{aligned}
 R &= 4\text{mm} = 0.4\text{cm} \\
 r &= 1\text{ mm} \\
 R + r &= 4\text{mm} = 0.4\text{cm} \\
 R - r &= 2\text{mm} = 0.2\text{cm}
 \end{aligned}$$

29. Let original two digit number = $(10x + y)$

Then, number obtained by

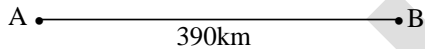
interchanging the digits = $(10y + x)$

By the sum,

$$\begin{aligned}
 (10x + y) - (10y + x) &= 36 \\
 = 9x - 9y &= 36 \\
 9(x - y) &= 36 \\
 \therefore x - y &= 4
 \end{aligned}$$

Ans : A

30.



Let time taken by train which starts at B = x hours

\Rightarrow distance travelled in x hours = $(65x)$ km

and another train from B to A takes $(x - 1)$ hours

\Rightarrow distance travelled in $(x - 1)$ hours = $35(x - 1)$ km

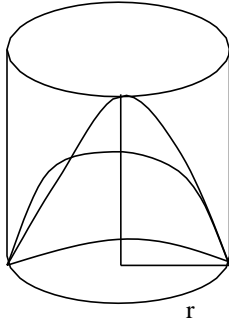
By the sum,

$$\begin{aligned}
 65x + 35x - 35 &= 390 \\
 100x &= 390 + 35 \\
 100x &= 425 \\
 x &= 4.25\text{hrs}
 \end{aligned}$$

\therefore They meet at 2.15PM

Ans : B

31.

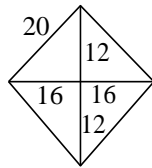


$$\frac{1}{3} \pi r^3 : \frac{2}{3} \pi r^3 : \pi r^3$$

$$1 : 2 : 3$$

Ans : C

32.



$$d_1 = 24$$

$$\frac{d_2}{2} = \sqrt{400 - 144}$$

$$= \sqrt{256} = 16$$

$$d_2 = 32$$

$$A = \frac{1}{2} d_1 \times d_2 = \frac{24 \times 32}{2} = 384 \text{ cm}^2$$

Ans : B

33 – 37

Sol: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

33. Sol: $E + K = 4 + 10 = 14 = 0$
 ANS: (A)

34. Sol: $B + U = 1 + 20 = 21 = V$
 ANS: (C)

35. Sol: $A + C + F = 0 + 2 + 5 = 7 = H$
 ANS: (C)

36. Sol: $L - S = 11 - 18 = -7 = T$
 A Z Y X W V U T I
 0 -1 -2 -3 -4 -5 -6 -7
 ANS: (B)

37. - D - P = -3-15 = -18 = I

Now

A Z Y X W V U T S R Q P O N M L K J I
0 -1 -2 -3 -4 -5 -6 -7 -8 -9 -10 -11 -12 -13 -14 -15 -16 -17 -18

ANS: (C)

38.

GOOD → J P R G
7 1 5 1 5 4 1 0 1 8 1 8 7
(7 + 3)(15 + 3)(4 + 7)

Sol:

⇒ F R U I T → I U X L W
6 1 8 2 1 9 2 0 9 2 1 2 4 1 2 2 3

ANS : (B)

39.

JUNGLE → J N LEGU
1 2 3 4 5 6 1 3 5 6 4 2

Sol : FOREST → FRSTEO

1 2 3 4 5 6 1 3 5 6 4 2

ANS : (4)

40. Sol: 10th consonant from B - M

B C D F G H J K L M
1 2 3 4 5 6 7 8 9 10th

ANS: (A)

41. Sol:

ECONOMY → Clearly MY are there in ECONOMY
SECOND while MY are not there in SECOND

ANS : (A)

42. Sol: N O P Q R S T U V W X Y Z - T divides N and Z

ANS: (C)

43. Sol : All others except (C) are religions

ANS: (C) Permission

44. Sol: All other are eatables except (A)

Ans: (A) Hunger

45. Sol: All others belong to royalty except (D)

ANS: (D) Labour

46. Sol: All others are countries except (B)

ANS: (B) West Bengal

47. Sol: The elements are moving to the next side clock wise

ANS: (A)

48. Sol: The outer circles are going inside, so lines go outside

ANS: (C)

49. Sol: The lines are moving to next side clockwise and one of the line is removed and added. In the front side

ANS: A

50. Sol: That triangle and star are moving one side clockwise and circle and square interchange their places.
ANS: D
51. Sol: To the existing figure water image is added.
ANS: (B)
52. Sol: The figure is rotated by 180°
ANS: (A)
53. Sol : The second circle become a smaller in the same way line become small
ANS: (C)
54. Sol: Mirror image and then water image
ANS: (A)
55. Sol: Inverted L remains the same, u get water image
ANS: (B)
56. Sol: Rotated by 90° anticlockwise in successive figures
ANS:(A)
57. Sol: The geometrical figure doubles
ANS: (C)
58. Sol: The figure is rotated by 90° clockwise successively and the arc inside the circle moves to opposite sides successively
ANS: (A)
59. Sol: All are arc except 4
ANS: (D)
60. Sol: Except 4 all are balanced
ANS: (D)
61. Sol: Outer 3 sides inside 4 sides
ANS: (D)
62. Sol: Outer 5 sides inside 3 sides
ANS: (C)
63. Sol: Outer 5 sides inside 4 sides
ANS: (A)
64. Sol: The same geometrical figure double inside
ANS: (B)
65. ANS: (A)

Q. 66 – Q. 70

J, M (un married Ladies No command in any subject)

(Husband) (Wife) (Brother of L)
 N = L - K

Master in sports K	Master in current affairs N	Master in art & culture L
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66. Sol: Master of sports 'K'

ANS: (D)

67. Sol: Master of art and culture 'L'

ANS: (B)

68. Sol: Master of current events 'N'

ANS: (A)

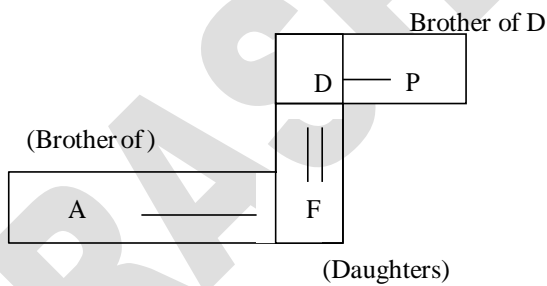
69. Sol: Wife of N & 'L'

ANS: (D)

70. Sol: Three ladies are J, L and M

ANS: (C)

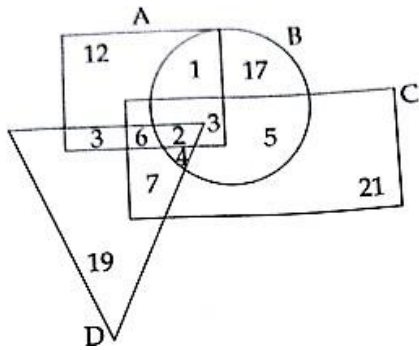
71. Sol:



P is uncle of A

ANS: (B)

72 - 74



A – Tamil
 B – English
 C – Malayalam
 D – Telugu

72. Sol: Both English and Tamil

A and B
 $1 + 2 + 3 = 6$
 ANS: (D)

73. Sol: English, Telugu and Malayalam B,C,D = $2 + 4 + 6 = 6$

ANS: (C)

74. Sol: Either English or Malayalam B, C

$1 + 17 + 3 + 5 + 2 + 4 + 6 + 7 + 21 = 66$
 ANS: (A)

75. Sol: Population = 100

Tot students = 100

In figure

Students who don't speak either language = $100 - 100 = 0$

ANS: (B)

76. Sol:

5	7	X
3	4	12
6	y	18
11	9	99

$3 \times 4 = 12$

$5 \times 7 = x \Rightarrow x = 35$

$6y = 18 \Rightarrow y = 3$

$9 \times 11 = 99$

ANS : B

77. Sol:

0	-2	?
2	0	6
5	-6	0

1st row is additive universe of 1st column ? = - 5

ANS: (B)

78. Sol: a - aa -a - baa - aaba
ab aab aabaab aaba

bbab

ANS : (B)

79. Sol: AP PL E 7 9

V B B G E Δ 6

ANS: Nearest answer is B

80. Sol: T R U T H

Δ B ∩ L H

ANS: A

□ is greater than

Δ is smaller than

⊙ is equal to

≠ is not equal to

81. Sol: A > B

C < B

D = C

A > B > C = D

So C > A

ANS: (A)

82. Sol: C < B = A

A ≠ C

So C < A

A > C

ANS: (D)

83. Sol:

A < C

B > C

B = E

So A < C < B = E

⇒ A < C

ANS : (B)

84. Sol:

A > O

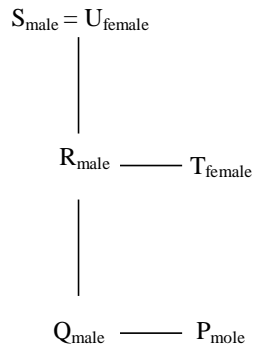
AB > AC

⇒ B > C

So B + D > C + D

ANS : (C)

(85 – 89)



85. ANS: (B)

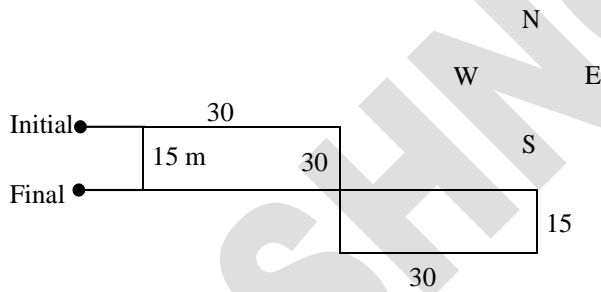
86. ANS: (A)

87. ANS: (C)

88. ANS: (A)

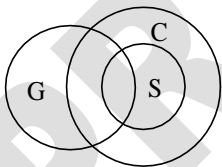
89. ANS: (B)

90.



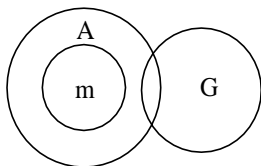
ANS: (D)

91.



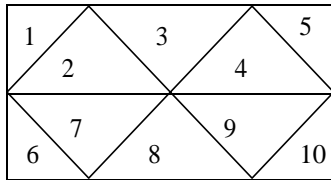
ANS: (B)

92.



ANS: (C)

93.



ANS: (A)

94. Sol: In first figure, 2 and 1 are adjacent with 5 on other side
In second figure, 2 and 1 are again adjacent with 4 on other side
Hence it means 2 and 4 are on opposite faces

ANS: (D)

95. Sol: 1, 2, 6, 5 are adjacent sides of 3.
4 must be opposite of 3
Hence the other no.4 must be opposite of 3

ANS: (A)

96. Sol:

MALAYALAM

MAIAYAJAM

ANS: (B)

97. Sol:

EFFECTIVE

EFFECTIVE

ANS: (A)

98. Sol:

MAGAZINE

MAGAZINE

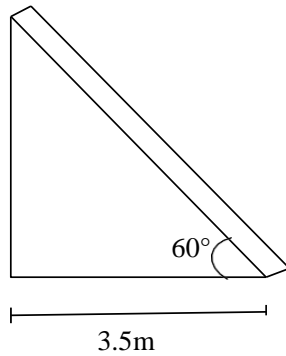
ANS: (D)

99. Sol:

$$\begin{aligned}\theta &= \left| 30^\circ - \frac{11}{2} \right| \\ &= \left| 30^\circ - \frac{11}{2} \times 45^\circ \right| \\ &= \left| 180^\circ - 247.5^\circ \right| \\ &= 67.5^\circ\end{aligned}$$

ANS : (D)

100. Sol.



:

$$\cos 60^\circ = \frac{\text{base}}{\text{hyp.}} = \frac{3.5}{\text{hyp}} = \frac{1}{2}$$

$$\Rightarrow \text{hyp} = 7 \text{ cm}$$

ANS : (A)