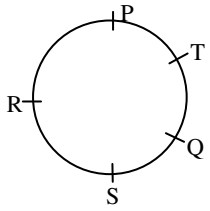
NTSE winner
For Class X Students

GENERAL MENTAL ABILITY TEST- SOLUTIONS

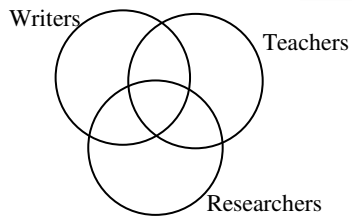
NTSE Stage 1: 2020-21	TOTAL QUESTIONS: 100 TOTAL MARKS: 100 DURATION: 120 MIN DATE: 25.01.2021

1. **Ans** (C)
   Arrangement is
   e k a j b l g c h d f

2. **Ans** (A)



3. **Ans** (D)



4. **Ans** (**NO OPTION HOLDS GOOD**)

5. **Ans** (D)
   Letter “a”is opposite to “c”.

6. **Ans** (A)
7. **Ans** (D)
8. **Ans** (A)
9. **Ans** (C)

10. **Ans** (D)

Number of odd days for 2000 years = 0

Number of odd days in 2001

J – 3

F – 0

M – 3

A – 4

10

10 = 3 odd days. So, it is a Wednesday

11. **Ans** (C)

Let the ages of a, b and c 10 years ago be 2x, 3x and 4x respectively

$\therefore$ 2x + 10 + 3x + 10 + 4x + 10 = 93

$\Rightarrow$ 9x + 30 = 93

$\Rightarrow$ 9x = 93 – 30 = 63

$\therefore$ x = 7

Present age of C = 4x + 10 = 28 + 10 = 38 years

12. **Ans** (A)

Let Ravi's age and Raju's age be 4x and 3x years

After 6 years Ravi's age is 4x + 6 years

$\therefore$ 4x + 6 = 26

$\Rightarrow$ 4x = 20

$\therefore$ x = 5

Thus, present age of Raju = 3x = 15 years

13. **Ans** (B)

Let the age of two persons 12 years ago be x and 4x years

$\therefore$ 4x – x = 18

$\Rightarrow$ 3x = 18

$\therefore$ x = 6

Present age of elder = 4x + 12

= 24 + 12 = 36 years

14. **Ans** (B)

Maize = $\frac{100}{360}\times 36 = 10\%$

Wheat $= \frac{100}{360}\times 18 = 5\%$

Wheat + Maize = 15 %

15. **Ans** (A)

18° is equivalent to 5.4 million acres

72° is equivalent to $\frac{5.4}{18}\times 72 = 21.6$

16. **Ans** (C)

$$\frac{\text{Area under rice}}{\text{Area under wheat}} = \frac{72}{18} = 4$$

$$\frac{\text{Production of rice}}{\text{Production of wheat}} = \frac{2}{1} = 2$$

$$\frac{\text{Yield [Area of rice]}}{\text{Yield [Area of wheat]}} = \frac{2}{4} = \frac{1}{2}$$

17. **Ans** (A)

18. **Ans** (D)

19. **Ans** (C)

34	42	86	24
P	A	L	M

20. **Ans** (D)

13	04	40	75
W	A	R	D

21. **Ans** (C)

31	:	69	:	351	:	**521**
$3^3 + 4$		$4^3 + 5$		$7^3 + 8$		$8^3 + 9$

22. **Ans** (B)

7124 : 48 : 3218 : ?

(7 + 1) (2 + 4) = 48

(3 + 2) (1 + 8) = **45**

23. **Ans** (D)

24	:	21	:	336	:	?
$3^3 - 3$		$3\times(3\times 2+1)$		$7^3 - 7$		$7\times(7\times 2+1)$

$= 7\times(7\times 2+1) = 7\times 15 =$ **105**

24. **Ans**(A)

10	:	115	:	22	:	?	:	204	:	?
(5×2)		$5^3 - 10$		$10\times 2+2$		12		$6^3 - 12$		$12\times 2+2$
										$= 26$

Solution for questions 25 – 27

T	R	Y	H	E	N	A	P	I	L	G
m	k	r	b	p	a	s	t	b / d	d / b	n

25. **Ans** (B)

T R I A N G L E
m k b s a n d p

26. **Ans** (A)

L E A T H E R
d p s m b p k

27. **Ans** (D)

P A T I E N T
t s m b p a m

28. **Ans** (C)

Conditions

maths≥ 1 and for each maths, graph ≥ 2

social ≥ 1 and for each social, graph ≥ 2

map ≥ 1 ⇒

graph ≥ 1 ⇒

Check options

social	**maths**	**map**	**graph**	**marks**
1 (3M)	3 (12 M)	2 (4 M)	6 (6 M)	25
2 (6 M)	2 (8 M)	4 (8 M)	4 (4 M)	26
3 (9 M)	**1 (4 M)**	**6 (12 M)**	**2 (2 M)**	**27**
4 (12 M)	0 (0 M)	8 (16 M)	0 (0 M)	28 (Rejected)

29. **Ans** (B)

From above table, when social = 3, maximum marks = 27

30. **Ans** (B)

$[(4 + 12 + 4 + 6)^2 - 2] = 26^2 - 2 = 676$

$[(4 + 14 + 18 + 6)^2 - 2] = 42^2 - 2 = 1762$

$[(12 + 14 + 10 + 16)^2 - 2] = 52^2 - 2 =$ **2702**

31. **Ans** (A) or (B)

Logic for Option (A)

$(9 \times 6 \times 4) \div (6 \times 4 \times 4) = \frac{9}{4}$

Logic for Option (B)

$(4 \times 5) \div (2 + 8 + 0) = 2$

$(6 \times 3) \div (4 + 7 + 1) = \frac{3}{2}$

$(9 \times 4) \div (4 + 6 + 2) = 3$

32. **Ans** (C)

$6^2 + 5^2 + 4^2 - 4^2 = 61$

$8^2 + 7^2 + 5^2 - 4^2 = 122$

$5^2 + 11^2 + 4^2 - \mathbf{1}^2 = 161$

33. **Ans** (B)

34. **Ans** (D)

35. **Ans** (C)

Solutions for Questions 36 – 37

From given bar graph and pie chart

Schools	**A**	**B**	**C**	**D**	**E**	**F**
Boys (3700)	500	400	900	600	1200	100
Girls (2300)	220	140	660	480	540	260

36. **Ans** (D)

$(660 + 540 + 600) = 1800$

37. **Ans** (C)

$900 : 140 : 1740 = 45 : 7 : 87$

38. **Ans** (C)

D I P S

W R K H ← corresponding letters

H O S T

S L H G ← corresponding letters

39. **Ans** (C)

P	O	N	D
↓–1	↓–3	↓–5	↓–7
N	K	H	V
H	E	A	R
↓–1	↓–3	↓–5	↓–7
F	A	U	J

40. **Ans** (A)

F	A	T	H	E	R
↓+1	↓+1	↓+1	↓+1	↓+1	↓+1
H	C	V	J	G	T

M	O	T	H	E	R
↓+1	↓+1	↓+1	↓+1	↓+1	↓+1
O	Q	V	J	G	T

41. **Ans** (B)

Total Hindi Books = $\frac{14}{100}\times 10,000 = 1400$

Out of this 6% (Hindi books) that are in bad condition = $\frac{6}{100}\times 1400 = 84$

42. **Ans** (D)

$\frac{23}{100}\times x$ = Kannada books

$= 0.23\ x$

Out of this 2% are in bad condition

$\Rightarrow \frac{2}{100}\times 0.23x$

$\Rightarrow \frac{2}{100}\times 0.23x = 92$

$\Rightarrow 0.23x = \frac{9200}{2}$

$\Rightarrow x = \frac{4600}{0.23} = \frac{460000}{23}$

English books = $\frac{20}{100}\times 20,000 = 4000$

43. **Ans** (A)

$\frac{2}{100}\times\frac{23}{100}\times x + \frac{1}{100}\times\frac{20}{100}\times x + \frac{14}{100}\times\frac{6}{100}\times x + \frac{16}{100}\times\frac{4}{100}x + \frac{27}{100}\times\frac{8}{100}x = 860$

$\Rightarrow \frac{1}{10000}(46x + 20x + 84x + 64x + 216x) = 860$

$430x = 860 \times 10000$

$x = 20000$

44. **Ans** (B)

1st January 2019 = Tuesday

1st January 2020 = Wednesday

1st January 2021 = Friday

1st January 2022 = Saturday

$\Rightarrow$ 31stDecember 2021 = Friday

45. **Ans** (A)

7 cannot represent second Saturday of any month

If 1^{st} is a Saturday, then the next Saturday has to be 8^{th}

46. **Ans** (D)

1904, 1908, 1912, …, 2000

a = 1904, d = 4, n = ?

$a_n = 2000$

$$\frac{2000-1904}{4}+1=n$$

$\Rightarrow n = 25$

47. **Ans** (D)

Options (A), (B) and (C) are corresponding letters, $\Rightarrow$ Option (D) that is HR is odd

48. **Ans** (B)

$243 = 3^5$

$6561 = 3^8$

$32 = 2^5$

$1024 = 4^5$

$\Rightarrow$ 6561 is the odd number

49. **Ans** (C) or (D)

Logic for (C) – It has only 1 vowel, other options have two vowels

Logic for (D)

Position numbers of Option (A) 5, 10, 15, 20

Position numbers of Option (B) 25, 5, 10, 15,

Position numbers of Option (C) 20, 25, 15, 10

Position numbers of Option (D) 15, 10, 5, 25 (this is in reverse order, hence its odd)

50. **Ans** (D)

	K	H	T	B	S
a		✔	✔	✔	✔
b	✔	✔	✔		
c			✔	✔	✔
d	✔		✔	✔	
e	✔	✔		✔	

51. **Ans** (B)

52. **Ans** (A)

53. **Ans** (C)

A alone completes work in 36 days.

$\Rightarrow$ In 1 day A completes $\frac{1}{36}^{th}$ of work

Let B alone complete work is x day

$\Rightarrow$ In 1 day B completes $\frac{1}{x}^{th}$ of work

$\therefore \frac{1}{36}+\frac{1}{x}=\frac{1}{9}$

$\frac{1}{x}=\frac{1}{9}-\frac{1}{36}$

$\frac{1}{x}=\frac{4-1}{36}=\frac{1}{12}$

$\Rightarrow x = 12$

54. **Ans** (A)

Let the number be x

$\Rightarrow \left(\frac{1}{3}x+\frac{1}{2}x\right)-\frac{2}{3}x=5,\ \frac{2}{5}x=?$

$\frac{5x}{6}-\frac{2x}{3}=5$

$\frac{5x-4x}{6}=5$

$x = 30$

$\Rightarrow \frac{2}{3}\times 30=12$

55. **Ans** (D)

Cost price of 72 oranges = ₹ 600

Total selling price of 72 oranges = (50 × 11) + 236 = 550 + 236 = ₹ 786

Profit = 786 – 600 = ₹ 186

56. **Ans** (C)

Kit, My, Leo, Ji, Sum

Step - 1 Kit, Leo, My, Sum, Ji

Step - 2 Ji, Sum, My, Leo, kit

Step - 3 Ji, My, Sum, Kit, Leo

57. **Ans** (B)

Given:

Step 3	40	33	12	21	68
Step 2	40	12	33	68	21
Step 1	21	68	33	12	40
Input	21	33	68	40	12

58. **Ans** (D)

Given

Step – 2 = Sot, Yin, Mes, Tog, Guv

Step – 1 = Guv, Tog, Mes, Yin, Sot

59. **Ans** (C)

60. **Ans** (B)

61. **Ans** (D)

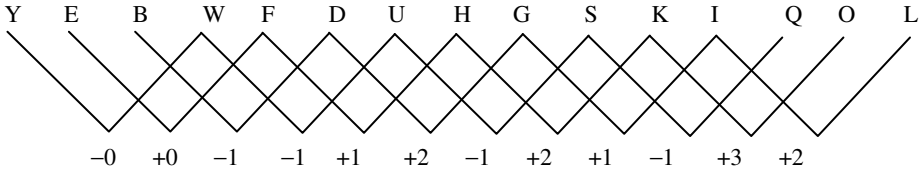
Corresponding letters

62. **Ans** (B)

Pattern = LKMN, LKMN, LKM

L | K | MN | L | K | M | N | L | KM

63. **Ans** (A)



64. **Ans** (B)

$4P_4 \times 2P_2$

$4! \times 2! = 24 \times 2 = 48$

65. **Ans** (D)

Weight of the beaker with water = 600 g

Weight of the empty beaker = 150 g

Weight of the half quantity of water = 600 – 150 = 450 g

Weight of full quantity of water = $450 \times 2 = 900$ g

$\frac{2}{5}$ quantity of water $= \frac{2}{5} \times 900 = 360$ g

$\therefore$ Weight of the beaker filled with $2/5^{th}$ water = 360 + 150 = 510 g

66. **Ans** (B)

Let the original length of rectangle = x, Let original breadth of the rectangle = y, Area = xy

New length of rectangle = 1.3x, New breadth of rectangle = 0.8y, New area of rectangle = 1.04 xy

Increase in area = 1.04 xy – xy = 0.04 xy

Percentage increase in area = (0.04xy / xy) × 100 = 4% increase

67. **Ans** (C)

$$\frac{(40-10)+(20-5)}{5}=\frac{30+15}{5}=\frac{45}{5}=9$$

Similarly, $\frac{(25-5)+(15-5)}{5}=\frac{20+10}{5}=\frac{30}{5}=6$

68. **Ans** (A)

$$\frac{(18\times6)-(12\times8)}{6}=\frac{12}{6}=2$$

Similarly, $\frac{(20\times5)-(10\times6)}{5}=\frac{40}{5}=8$

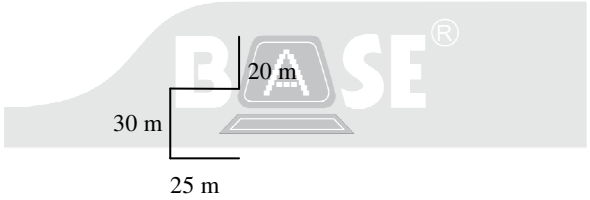
69. **Ans** (C)

$(3 + 5) \times (16 – 6) = 8 \times 10 = 80$

Similarly $(9 + 5) \times (13 – 7)$

$14 \times 6 = 84$

70. **Ans** (D)



He is 50 m away from his initial position.

71. **Ans** (B)

CD = 14 km, CE = 10 km

ED = 4 km

BC = 3 km = AE

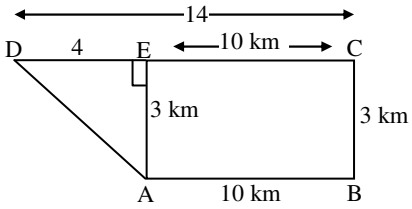
In ΔADE

$AD^2 = AE^2 + ED^2$

$= 3^2 + 4^2$

$= 9 + 16$

$AD^2 = 25$, AD = 5 km



72. **Ans** (A)

73. **Ans** (B)

$\sqrt{9}+\sqrt{25}=3+5=8$

74. **Ans** (B)

$$\frac{26+24}{25}=\frac{50}{25}=2$$

$$\frac{36+34}{14}=\frac{70}{14}=5$$

75. **Ans** (C)

$61+20=81$

$\therefore \sqrt{81}=9$

$10+26=36$

$\therefore \sqrt{36}=6$

76. **Ans** (A)

77. **Ans** (D)

78. **Ans** (B)

79. **Ans** (C)

80. **Ans** (A)

81. **Ans** (C)

$$\begin{array}{r} 3\ 6\ 2 \\ 3\ 2\ 2 \\ 6\ 5\ 5 \\ \hline 1\ 3\ 3\ 9 \end{array}$$

82. **Ans** (B)

$$\begin{array}{r} 1\ 5\ 6 \\ \times\ 2\ 7 \\ \hline 4\ 2\ 1\ 6 \end{array}$$

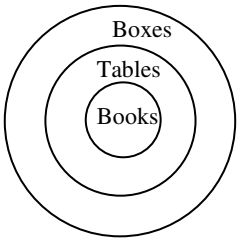
83. **Ans** (D)

$$\begin{array}{r} D\ U\ C\ K\ \times \\ \qquad\qquad K \\ \hline 5\ 5\ U\ D\ U \end{array}$$

U = 1

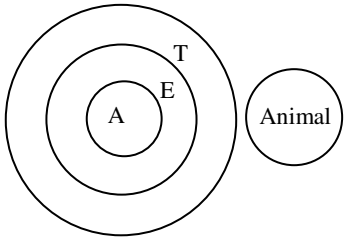
$$\begin{array}{r} 6\ 1\ 2\ 9 \\ \qquad\quad 9 \\ \hline 5\ 5\ 1\ 6\ 1 \end{array}$$

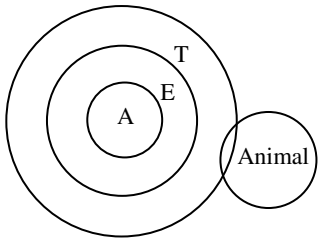
84. **Ans** (B)



85. **Ans** (C)

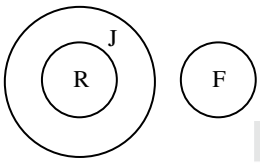
T = Tigers, E = Elephants, A = Ants





86. **Ans** (D)

R = Roses, J = Jasmine, F = Flower



87. **Ans** (B)

2	3	5	7		1	4	6	4	9		1	4	3	5	9
W	O	R	K		S	T	A	T	E		S	T	O	R	E

88. **Ans** (A)

BALL = 288

21 12 12

JACK

$10 \times 1 \times 3 \times 11 = 330$

89. **Ans** (A)

PAT = 22318

P	A	T
16	1	20
T	A	P
20	1	18
20+2	1+2	18+2
22	3	18

COW	3	15	23
	↓		
WOC	23+2	15+2	3+2

90. **Ans** (B)

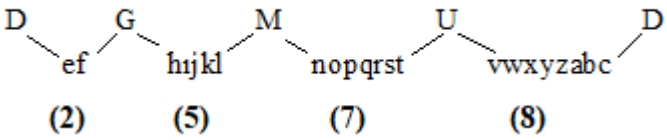
PARADISE

P + 1 = R

(1^{st}) A + 2 = D

(2^{nd}) A + 3 = E

91. **Ans** (D)



92. **Ans** (C)

J	O	U	R	N	E	Y
1	2	3	4	5	6	7
5	6	7	4	1	2	3
N	E	Y	R	J	O	U

5^{th} from right

93. **Ans** (D)

94. **Ans** (A)

9 + 5 + 4 = 18

95. **Ans** (C)

9 + 2 + 7 = 18

96. **Ans** (B)

$40 \times 5.5 = 220$

-90

$130°$

97. **Ans** (D)

Leap years repeat after 28 years, hence 1996 + 28 = 2024.

So, 2024 will have same calendar as 1996

98. **Ans** (D)

2000 years = 0 odd days

2001 to 2003 = $3 \times 1 = 3$ odd days

Jan	3
Feb	1
March	3
April	2
May	3
June	1
	13

Total odd days = 0 + 3 + 13 = 16 $\Rightarrow$ 2 odd days

Hence 1st June 2004 will be a Tuesday $\Rightarrow$ 4th June will be a Friday.

Hence, 3rd Friday of June 2004 will be on 4 + 14 = 18th June.

99. **Ans** (D)

We get 11 such sets of numbers which satisfy the given condition

354, 486, 867, 735, 312, 846, 624, 243,714, 597, 978

100. **Ans** (A)

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
1	2	3	4	**5** **C**	6	7	8	9	**10** **H**	11	12	13	14	**15** **M**	16	17	18	19	**20** **R**	21	22	23	24	**25** **W**	26

New series based on given conditions

A	B	C	D	E	F	G	H	I	J	Ⓚ	**L**	**M**	**Z**	**W**	Ⓧ

The number of consonants between K & X = 4

* * *