



**SOLUTION OF
SAMPLE PAPER
FOR**

NTSE STAGE -II

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MENTAL ABILITY TEST "(STAGE – II)"

1. Light means pie. & mie can not fly. So, that 'light fly' means can be pie zie.

Ans. A

S T U D E N T
-1 -1 -1 +1 -1 -1 -1
↓ ↓ ↓ ↓ ↓ ↓ ↓
R S T E D M S

Similarly

T E A C H E R

-1 -1 -1 +1 -1 -1 -1

S D Z D G D Q

- Ans. C
3. In this option T, V, W, Y, Z are not continuous.

Ans. D

4. $\alpha\beta\underline{\beta}, \alpha\alpha\underline{\alpha}, \beta\beta\beta\underline{\beta}, \alpha\alpha\alpha\alpha\underline{\alpha}, \beta\beta\beta.....$

Ans. B

5. Missing term is $3c$

Ans. C

6. simple logic

Ans. B

7. simple logic

Ans. D

8. $5^2 + 12^2 = 13^2$

$$8^2+15^2 = 17^2$$

$$7^2 + 24^2 = 25^2$$

$$9^2 + 40^2 = 41^2$$

A

Ans. A

9. $\rightarrow 60 + 61 = 121$ and

$$45 + 55 = 100$$

$$\sqrt{(121)} = 11, \sqrt{100} = 10$$

i.e. $11-10=1$

- $$\rightarrow 82 + 87 = 169 \quad \text{and}$$

$$49 + 32 = 81$$

$$\sqrt{169} = 13, \sqrt{81} = 9$$

i.e. $13 - 9 = 4$

- $$\rightarrow 79 + 65 = 144 \quad \text{and}$$

$$37 + 12 = 49$$

$$\sqrt{144} = 12, \sqrt{49} = 7$$

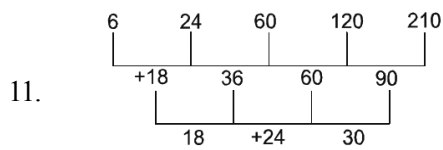
i.e. $12 - 7 = 5$.

Ans. C



10. $1^1 - 1, 2^2 - 2, 3^3 - 3, 4^4 - 4, 5^5 - 5.$

Ans. C



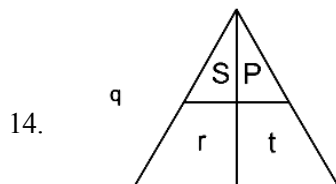
Ans. B

12. $3 + 4 + 5 = 12 \equiv L$
 $9 + 6 + 4 = 19 \equiv S$
 $7 + 1 + 8 = 16 \equiv P$
 i.e. $8 + 3 + 2 = 13 \equiv M$

Ans. A

13. 4973
 $\begin{array}{r} \times 8 \\ \hline 39784 \end{array}$

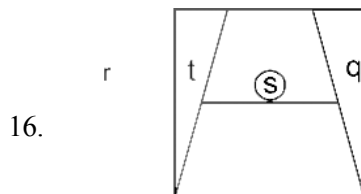
Ans. B



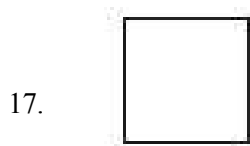
Ans. A

15. $2 \times 3 + 4 = 10$
 $10 \times 3 - 4 = 26$
 $26 \times 3 + 4 = 82$
 $82 \times 3 - 4 = 242$

Ans. C



Ans. B



Ans. C

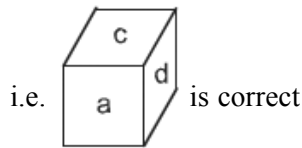
18. Net pattern will be :



i.e. Indigo is opposite to yellow

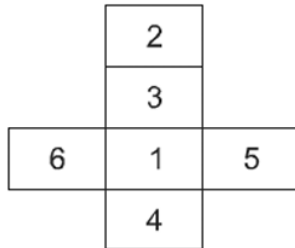
Ans. A

19. b is opposite to d.
a is opposite to f.
e is opposite to c.



Ans. D

20. Net pattern will be :



i.e. 6 is opposite to 5

Ans. D

21. Only g

Ans. A

22. C is odd man out

Ans. C

23. $\rightarrow 108 + 17 = 125 = (5)^3$ and $240 + 103 = 343 = (7)^3$

i.e. $7 - 5 = 2$

$\rightarrow 39 + 25 = 64 = (4)^3$ and $309 + 203 = 512 = (8)^3$

i.e. $8 - 4 = 4$

$\rightarrow 115 + 101 = 216 = (6)^3$ and $625 + 104 = 729 = (9)^3$

i.e. $9 - 6 = 3$.

Ans. A

24. By observation

Ans. D

25. After 12sec seconds hadn will make angle of 72° i.e it will be 18° North of east

Ans. A

- 26.

Let lengths are ℓ_1 & ℓ_2 and thickness are x_1 and x_2 .

$\ell_1 \equiv 3.5$ hr and $\ell_2 \equiv 5$ hr.

$$\ell_1 - 2\left(\frac{\ell_1}{3.5}\right) = \ell_2 - 2\left(\frac{\ell_2}{5}\right)$$

$$\frac{3.5\ell_2 - 2\ell_1}{3.5} = \frac{5\ell_2 - 2\ell_2}{5}$$

$$\frac{1.5\ell_1}{3.5} = \frac{3\ell_2}{5}$$

$$\frac{\ell_1}{\ell_2} = \frac{3.5 \times 3}{1.5 \times 5} \Rightarrow \frac{7}{5} \quad \text{or} \quad \frac{\ell_2}{\ell_1} = \frac{5}{7}$$

Ans. B

27. Let total gift are x .

i.e. dolls are $= x - 6$

cars are $= x - 6$

books are $= x - 6$.

i.e. $x = 3(x - 6)$

$x = 3x - 18$

$18 = 2x$

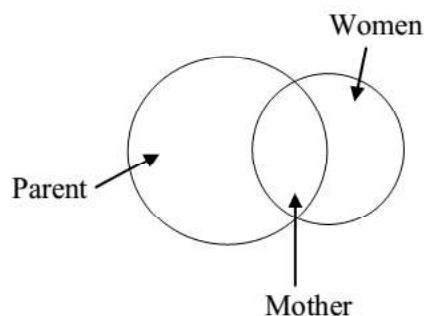
$x = 9$

Ans. A

28. From the given information we can say that $R < S$, $K < S$. But, we cannot confirm if $T < S$ or $T > S$. So we cannot determine the oldest.

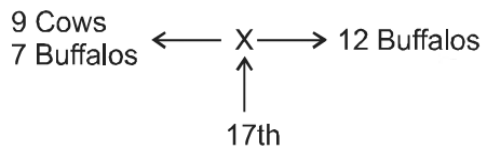
Ans. D

29. Sol. Mother is represented by the common part of Women and Parent.



Ans. A

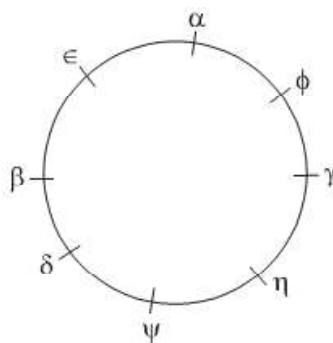
30. Cows are $= 40$ and Buffalos are $= 20$



Ans. C

31. By observation

Ans. A



32-36

32. ϕ

Ans. C

33. β, ϵ

Ans. B

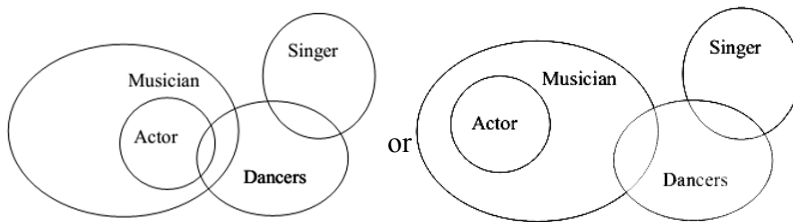
34. Third towards right

Ans. A

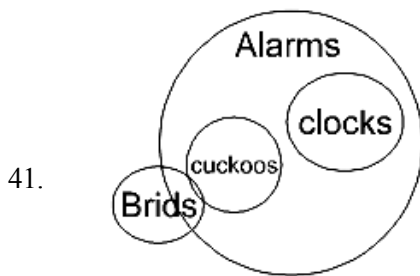
35. Only ϵ

Ans. C

36. 3
Ans. D
37. 119 matches will be played.
Ans. C
38. Sadhana < Rani < Alka < Lata < Asha.
Ans. A
39. 64 matches will be played.
Ans. C
40. From the given information, only conclusion III follows. I cannot follow as No Actor is a Singer (from Statement I and II).



Ans. B



41.

- Ans. A
42. We can label the cells as follow

A	B	○
C	D	E
×	F	G

If cross is put on the Cell G (bottom row right corner):

Case I – Circle is put in Cell F.

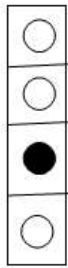
Then Cross puts it in Cell A. Now Circle will put either in Cell C or in Cell D. Then Cross puts it in the other one and Cross wins.

Case II – Circle puts it anywhere other than F.

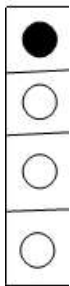
Cross puts in Cell F and wins.

Ans. A

43. If all the switches were on the configuration 2 would be:



But the configuration 2 is given as:



There is difference only in Switches 1 and 3. So switch C is not working.

Ans. C

44. By observation

Ans. C

45. By observation

Ans. C

46. E B A C D

Ans. B

47. Leaving time = 7 hr 21 m 49 sec.

and Returned time = 7 hr 54 m 33 sec.

Ans. D

48. 21° east of south

Ans. B

49. By observation

Ans. D

50. By observation

Ans. A

51. The pattern the series is as follows :

D	→ ⁺³	G	→ ⁺³	J	→ ⁺³	M	→ ⁺³	P
3	→ ^{(3)²}	9	→ ^{(3)³}	27	→ ^{(3)⁴}	81	→ ^{(3)⁵}	243
Y	→ ⁻⁴	U	→ ⁻⁴	Q	→ ⁻⁴	M	→ ⁻⁴	I
104	→ ⁻¹³	91	→ ⁻¹³	78	→ ⁻¹³	65	→ ⁻¹³	52

So, the next term will be P243I52.

Ans. C

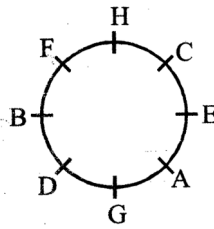
52. As, $(0.8)^3 = 0.512$

Similarly, $(0.04)^3 = .000064$

So, 000064 will replace the question mark.

Ans. C

Direction (53 – 55) : According to the given information, the sitting arrangement is as following :



53. F is sitting third to the left of G
So, option (B) is correct.

Ans. B

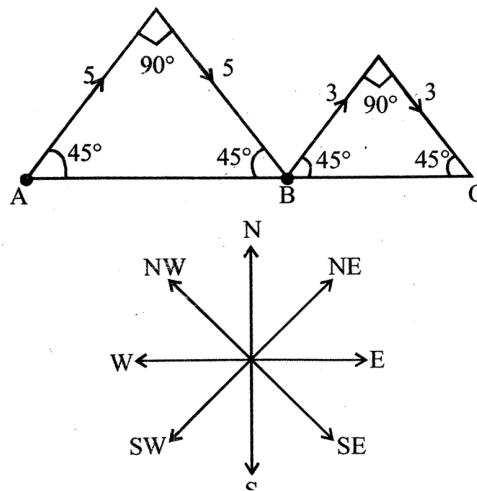
54. H & F are sitting next to each other. So, option (C) is correct.

Ans. C

55. ECHFBDBG is the correct order of sitting of persons right of A. Hence, option (B) is correct.

Ans. B

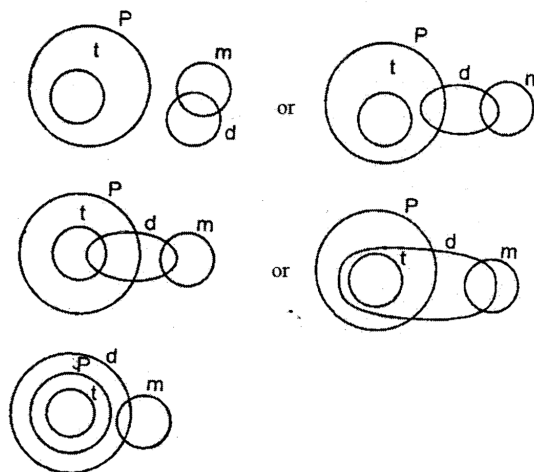
56. According to the given information, the direction ,movements of Amita is as follows :



Here, A is the starting point and C is the final point. It is clearly shown from the above direction diagram that the direction of point B and C is east directions with respect to point A. Hence option (A) is correct answer.

Ans. A

57. On the basis of given statements in the question, the venn diagram is as follows :



Here, T = Teachers
or

P = Professors

M = Male

D = Designer

So, either I and III follows ; or II and III follows. Hence, option (D) is correct answer.

Ans. D

58. In each step, each elements of the figures shift one side clockwise direction with rotation of 180°. So, option (C) is correct.

Ans. C

59. On the basis of information given in the question diagram, I represents male trainers who play circket because I is common in rectangle, circleand triangle. So, Option (B) is correct answer.

Ans. B

Direction (60 – 62) : According to the given information, the arrangement is as follows :

	2 nd Hindi	5 th Eng	3 rd Sci 1 st	3 rd Maths	4 th Sanskrit
A 3 rd	×	×	×	✓	×
B	×	×	✓	×	×
C	✓	×	×	×	×
D 5 th	×	✓	×	×	×
E 4 th	×	×	×	×	✓

Periods	Subjects	Teachers
1	Science	B
2	Hindi	C
3	Maths	A
4	Sanskrit	E
5	English	D

60. C teaches Hindi in 2nd period

Ans. A

61. Sanskrit – 4 – E is the correct sequence of subject period teacher

Ans. B

62. Mathematics, Science, Hindi, English, Sanskrit subject taught by teachers A, B, C, D and E respectively.

Ans. D

63. According to the given information :

	Green	
Blue	Yellow	Black
	Red	
	Orange	

It is clear from the above diagram that the colour of the side having question mark is green.

Ans. C

64. Given that,

$$33 \times 11 \div 9 \times 28 + 4 - 5$$

after changing the sign \div $33 \times 11 \div 9 \times 28 + 4 - 5$

$$= -33 + 11 - 9 + 28 \div 4 \times 5$$

$$= -33 + 11 - 9 + 7 \times 5$$

$$= -42 + 46 = 4$$

So, option (C) is correct answer.

Ans. C

65.

18	5	1	19	15	14
R	E	A	S	O	N
As, -2↓	+2↓	-2↓	+2↓	-2↓	+2↓
16	7	25	21	13	16
P	G	Y	U	M	P

Similarly,

4	9	18	5	3	20
D	I	R	E	C	T
-2↓	+2↓	-2↓	+2↓	-2↓	+2↓
B	K	P	G	A	V
2	11	16	7	1	22

So, DIRECT will be coded as BKPGAV.

Ans. A

66.

Husband = Wife

```

      /  \  \
     /    \  \
    A      B  C
  
```

Present age husband = Present age of wife + 5.

Present age of wife = 2 × present age of A

Present age of A = 12 + Present age of B

Present age of B = $\frac{3}{2}$ × Present age of C

Present age of C = 12 years

$$B = \frac{3}{2} \times \frac{6}{12} = 18 \text{ yrs.}$$

A = 12 + 18 = 30 years

Wife = 2 × 30 = 60 years

Husband = 65 years

∴ Friend's age = Age of husband – 15 = 50 years.

Ans. B

67. Given,

Pritam, Zeba, Joy & Anu

Alphabetical order → Anu, Joy, Pritam, Zeba,

Working days → Monday – Friday → 3 weeks → 15 days

Anu	Joy	Pritam	Zeba
4 day	4 day	4 day	3 day

It is clear from the above information that Zeba worked for least number of days and 3 days if the duties are assigned for 3 weeks.

Ans. C



	Week	Mon	Tue	Wed	Thu	Fri
68.	1st→	A	J	P	Z	A
	2nd→	J	P	Z	A	J
	3rd→	P	Z	A	J	P

OR

Anu	M		
Joy	T	M	
Pri	W	T	M
Zeba	Th	W	Tu
Anu	Fri	Th	W
Joy		Fri	Th
Pri			Fri

So, from the above analysis, Pritam, Zeba and Anu were assigned duties on Wednesday in Ist, 2nd and 3rd week respectively.

Ans. A

69. $S.P. = 1000 \times \frac{40}{100} \times \frac{60}{100} = 240$

Ans. D

70. $4 \times 5 = 20$

4	5
2	5

$$\frac{-(2+5) = -7}{13}$$

$6 \times 4 = 24$

6	4
7	2

$$\frac{-(7+2) = -9}{15}$$

and

$9 \times 3 = 27$

9	3
4	5

$$\frac{-(4+5) = -9}{18}$$

Similarly,

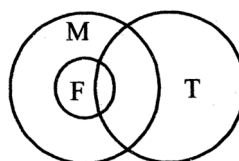
$8 \times 3 = 24$

8	3
4	6

$$\frac{-(4+6) = -10}{14}$$

Ans. B

71. The best relation among men, fathers and teachers is as shown below :



Here, all fathers are men and some fathers can be teachers. So, option (B) is correct answer.

Ans. B

72. As, guitar is for music. Similarly, book is for knowledge.

Ans. D

73. Given that, Reena > Rita > Zoha

$$x + 2 \quad x \quad x - 3$$

According to the question, $2x - 1 = 3(x - 5)$

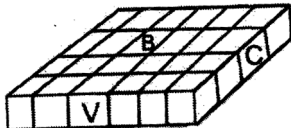
$$2x - 1 = 3x - 15$$

$$x = 14 \text{ years}$$

Therefore, the current age of Rita is 14 years.

Ans. B

Direction (74 – 76) : According to the given information,



Here,

B → butter, scotch cream

C → Chocolate and

V → Vanilla cream

74. 12 cake pieces are there which have only two types of coating of cream.

Ans. C

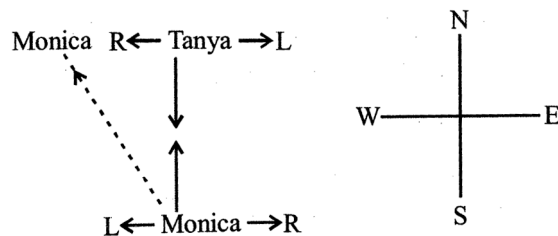
75. 8 cake pieces will have only one type of coating of cream.

Ans. B

76. 16 cake pieces will be available for others.

Ans. C

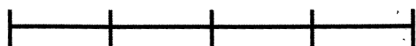
77. On the basis of given information, the direction diagram of Tanya and Monica is as following :



So, it is clearly shown that Monica was facing north direction. Hence, option (A) is correct answer.

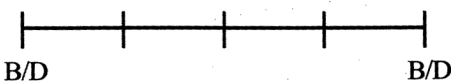
Ans. A

78. From the given question :

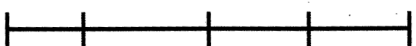


A is sitting next to E.

From statement I,

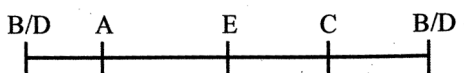


From statement II,



C is not sitting next to A.

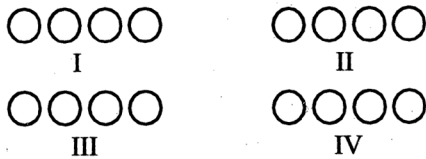
By combining all the above information, we get



So, E is sitting between A and C.

Ans. C

79. We have four horses in one race
Divide 16 horses in four groups



Now, two conditions are there

I – If both the fastest are in same group and

II – If one is in one group and 2nd is in other group. To determine the fastest, four races in groups now conduct 5th race between all groups toppers so we can determine the fastest.

Now, in 6th race take 2nd of 5th race, take rest 3 of the group from which the fastest horse.

So, the topper of 6th will be 2nd topper of 16.

Ans. A

80. The pattern of the series is as follows :

b	c	e	g	k	?	q	s
2	3	5	7	11	13	17	19

series of prime no. 13 = m.

So, m will replaces the question mark.

Ans. B

81. Option (C) will replaces the question mark.

Ans. C

82. Here, $5 \rightarrow 3 \rightarrow 2$

$1 \rightarrow 4 \rightarrow 6$

So, opp. of 2 is 6.

Ans. D

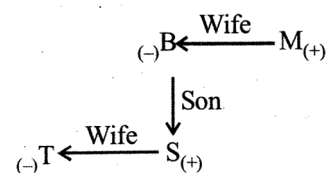
83. The pattern of the series is as follows :

2, 10, 30, 68,.....,222

$1^3 + 1, 2^3 + 2, 3^3 + 3, 4^3 + 4, 5^3 + 5, 5^3 + 5 = 125 + 5 = 130$

Ans. B

84. Given, $T - S \times B - M$

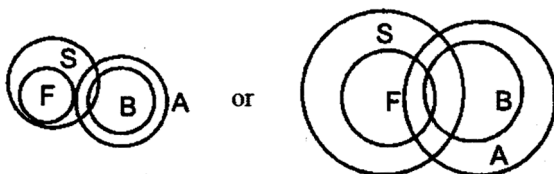


S is son of B, not daughter.

So, option (C) is correct answer.

Ans. C

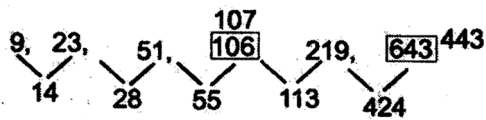
85. The venn diagram is as follows :



So, either I or II & III follows. Hence option (A) is correct.

Ans. A

86. The pattern of the series is as follows :



So, option (C) is correct answer.

Ans. C

87. The water image of the characters as shown below :

S U P E 2 5 4 7 D L R

R ɹ Ԁ ԝ 3 2 4 1 D Ԁ ԝ

Characters water image

So, option (D) is correct answer

Ans. D

88. As, $R > V$

$A > P$ (Parul lies between R and A)

$S > P$

$A > P > R > V$

In case – I

$S > A > P > R > V$

In case – II

$A > S > P > R > V$.

So, parul is elder to Venn. Hence, option (D) is correct answer.

Ans. D

89. As, $1^2 + 5^2 + 7^2 = 75$

and, $9^2 + 7^2 + 8^2 = 194$

So, $8^2 + 3^2 + 4^2 = 89$

Ans. C

90. Option figure (A) is correct answer when it is folded

Ans. A

91. For 8 beats it takes 7 intervals

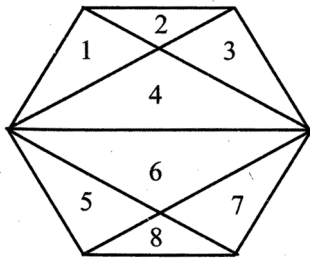
7 interval – 8 sec.

1 interval – $\frac{8}{7}$ sec.

10 intervals – $\frac{8}{7} \times 10 = 11.43$ second

Ans. B

92. As,



As,

Pieces

4

(1,2,3,4) (5,6,7,8) (1,4,5,6) (3,4,5,6) (7,6,4,3) (1,4,6,7)

Pieces

3

(1,4,6) (4,6,5) (3,4,6) (4,6,7)

Pieces

2

(4,6)

So, there are 11 quadrilaterals.

Ans. C

Direction (93 – 95) : According to the given information, the arrangement of six boys is as following :

BOYS	GAMES					
	Foot- ball	Cri- cket	Tennis	(Tallest) Kabaddi	Squash	(Shortest) Volleyball
Tarun	✓	×	×	×	×	×
Umesh	×	×	×	✓	×	×
Prem	×			×		×
Kamal	×			×		×
Ramesh	×	×	×	×	×	✓
Shyam	×			×		×

According to their heights : $U > K > T > P > S > R$

93. Umesh plays Kabaddi among them

Ans. D

94. According to the descending order of their heights, Prem will be at fourth place.

Ans. A

95. We can't determine that who plays tennis.

Ans. A

96. The pattern of the series is as follows :

$$\frac{121}{11^2} \frac{81}{9^2} 99(10^2 - 1), \frac{100}{10^2} \frac{64}{8^2} 80(9^2 - 1), \frac{81}{9^2} \frac{49}{7^2} 63(8^2 - 1),$$

$$\frac{64}{8^2} \frac{36}{6^2} 48(7^2 - 1), \frac{49}{7^2} \frac{25}{5^2} 35(6^2 - 1)$$

So, the next term will be 492 535.

Ans. C

97. As, In Ist figure : $(6 - 5)^3 + 1^2 \Rightarrow 2$,
 In 2nd figure : $(12 - 10)^3 + 2^2 \Rightarrow 12$ and
 In 4th figure : $(24 - 20)^3 + 4^2 \Rightarrow 80$
 Similarly, In 3rd figure : $(18 - 15)^3 + 3^2 \Rightarrow 36$
 So, 36 will replace the question mark.

Ans. C

98. According to the given coding language :

$$\textcircled{S} \text{ T } \boxed{A} \text{ T } \rightarrow \theta \delta \theta \textcircled{\gamma} \quad \dots(i)$$

$$\text{R } \boxed{A} \text{ T } \rightarrow \boxed{\delta} \theta \beta \quad \dots(ii)$$

$$\textcircled{S} \boxed{A} \text{ Y } \rightarrow \varepsilon \textcircled{\gamma} \boxed{\delta} \quad \dots(iii)$$

From the above coding language,

→ T is common in (i) and (ii), and the code for T is θ

→ A is common in (ii) and (iii), and the code for A is δ .

→ S is common in (i) and (iii), and the code for S is γ .

So, T → θ

R → β

A → δ

Y → ε

Therefore, from the given options, only option (C) is correct answer.

Ans. C

99. Here, $20 \times 25 = 500$

500 = First 5 days Second 5 day

10×5 15×5

50 75

Third 5 day Fourth 5 day

20×5 25×5

100 125

Fifth 5 day

30×5

150

$50 + 75 + 100 + 125 + 150 = 500$

So, 25 days the work will be completed.

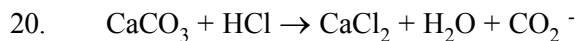
Ans. B

100. Here, length of diagonal = $\sqrt{l^2 + h^2 + b^2} = \sqrt{1+1+1} = \sqrt{3}$

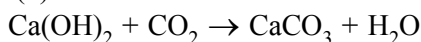
Ans. C

SCHOLASTIC APTITUDE TEST "(STAGE – II)"

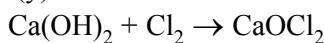
1. Animal cell, plant cell and bacterium cell have plasma membrane, cytoplasm and ribosomes as common part.
Ans. D
2. Figure B shows striated muscles. They have alternate light and dark bands. They move according to will. These are also known as skeletal muscles.
Ans. B
3. Pteridophytes are first vascular plants which do not possess seeds and fruits.
Ans. D
4. Bacteria *Helicobacter pylori* is responsible for peptic ulcers.
Ans. C
5. There is no atmosphere on moon so temperature is variable.
Ans. A
6. If stamens are just above the stigma of pistil in a flower it increases chances of self pollination.
Ans. B
7. Air from mouth contains CO_2 which is utilized in photosynthesis hence increase in O_2 production.
Ans. B
8. A person with blood group 'A' can donate blood to persons with blood group A or 'AB' because it has only 'A' antigen and 'b' antibodies.
Ans. B
9. Cerebellum co-ordinates muscular activity of the body. It also maintains equilibrium or posture of the body during walking jumping etc.
Ans. C
10. Tapeworm and earthworm both are hermaphrodites but in tapeworms self fertilization takes place while earthworm undergoes cross-fertilization.
Ans. D
11. In this case natural selection is directing evolution in the beetle population. Natural selection brings about improved adaptive relations between organisms and environment by favouring the reproduction and survival of more suited organism to the given environment.
Ans. B
12. The green beetles cannot be seen by crows. So they are not eaten. Increased feeding of red beetles by crow will result in drastic reduction of red beetles and increased number of green beetles in the population.
Ans. D
13. Question is not correct.
Ans. (Bonus)
14. Non-degradable and fat soluble pollutant, such as DDT enters the food chain and magnifies in concentration at each trophic level. It is known as biomagnification.
Ans. A
15. If liquid A gives more cooling effect then latent heat of vaporisation of liquid A is low.
Ans. C
16. D
17. $\text{H}_2 + \frac{1}{2}\text{O}_2 \rightarrow \text{H}_2\text{O}$ [Law of conservation of mass is valid for chemical change only]. 2gm 16gm 18gm
Ans. A
18. Element X having atomic number 9, contain 9 protons and its valence shell contains 7 electrons, to acquire noble gas configuration it accept one electron.
Ans. D
19. $\text{C}_{(s)} + \text{O}_2 (g) \rightarrow \text{CO}_2 (g) + \text{heat}$. It is combination and combustion reaction.
Ans. C



(x)



(y)



(z)

Ans. A

21. Weak Acid + Weak Base \rightarrow Salt + Water

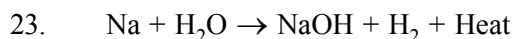
Metal + Mineral Acid \rightarrow Salt + Hydrogen

Metal Oxide + Mineral Acid \rightarrow Salt + Water

Ans. C

22. When Al is dipped in HNO_3 , it forms layer of Al_2O_3 which decrease the reactivity of Al.

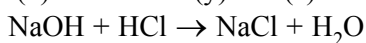
Ans. A



(x)

(y)

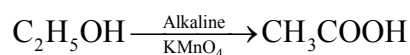
(z)



(pH = 7)

(neutral)

Ans. D



(y)

(x)



(x)

(y)

(z)

Ans. B

25. C_2H_2 & C_3H_6 are unsaturated hydrocarbon so they can give combustion and addition reaction both.

Ans. D

26. X is N because it is placed on the right side of the periodic table & compound is NH_3 . X is a non metal and valence e^- 's are 5 & $\text{NH}_3 + \text{H}_2\text{O} \rightarrow \text{NH}_4\text{OH}$ (Base)

Ans. C

27. X = Mg

Y = Cl

Z = MgCl_2 (XY_2)

MgCl_2 is an ionic compound & it conduct electricity in the molten state.

Ans. D

28. Speed of sonar wave decreases in air and so it takes longer time.

Ans. C

29. Incident ray parallel to principal axis passes through the focus and incident ray passing through focus emerges parallel to principal axis.

Ans. A

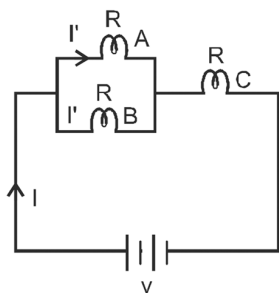
30. Image of a far object must be produced by the concave lens at a distance more than 25 cm from the eye. So all focal lengths of concave lens are not possible.

Ans. B

31. Work done under centripetal force is always zero because force & displacement are perpendicular to each other.

Ans. D

32.



$$I = \frac{2V}{3R}$$

$$\Rightarrow I' = \frac{I}{2} = \frac{V}{3R}$$

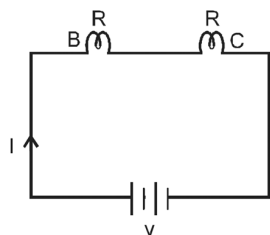
\therefore Power developed in A & B

$$= (I')^2 R = \frac{V^2}{9R^2} \times R = \frac{V^2}{9R}$$

Power developed in

$$C = I^2 R = \frac{4V^2}{9R^2} \times R = \frac{4V^2}{9R}$$

When A is burnt, circuit is



$$I = \frac{V}{2R}$$

\therefore Power developed in

$$\text{B or C} = I^2 R = \frac{V^2}{4R^2} \times R = \frac{V^2}{4R}$$

\therefore Power of B increases

Power of C decreases

Ans. C

33. Currents in arm AB in all the circuits are same and is equal to $\frac{E}{2R}$

Ans. C

34. Law of conservation of momentum is applicable.

$$\therefore (MV)_{\text{Th}} = -(mv)_{\text{He}}$$

$$\Rightarrow |(MV)_{\text{Th}}| = |(mv)_{\text{He}}| = p(\text{say})$$

$$\therefore (KE)_{\text{Th}} = \frac{p^2}{2M} \text{ and } (KE)_{\text{He}} = \frac{p^2}{2m}$$

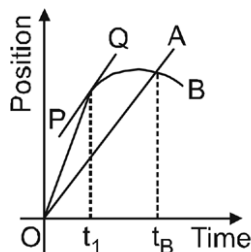
Obviously, $(KE)_{\text{Th}} < (KE)_{\text{He}}$ ($\because M > m$)

Ans. D

35. The displacement of the ball decreases more rapidly initially and as time passes by, rate of decrease in displacement reduces.

Ans. A

36. As evident from the graph, slope of tangent PQ and slope of OA are equal. Hence B and A have same velocity at t_1 (which is less than t_B).



Ans. C

37. Average speed = $\frac{20}{20} = 1 \text{ m/s}$

Maximum speed is attained between $t = 10 \text{ s}$ to $t = 20 \text{ s}$

$$\therefore \text{Maximum speed} = \frac{16}{8} = 2 \text{ m/s}$$

Ans. A

38. Ist case :

$$g = \frac{G \left(\frac{4}{3} \pi R^3 \rho \right)}{R^2} = \frac{4}{3} \pi G R \rho$$

IInd case :

$$g' = \frac{G \left(\frac{4}{3} \pi (2R)^3 \rho \right)}{(2R)} = 2 \left[\frac{4}{3} \pi R G \rho \right]$$

Ans. B

39. Plastic ring P and copper ring R will not suffer any repulsive force. So, they will fall together first.

Ans. C

40. Velocity and force changes due to change in direction but magnitude of momentum and KE of electron remain constant as speed is constant.

Ans. D

41. Volume of box

$$V = (12 - 2x)^2 x$$

$$V = (144 + 4x^2 - 48x)x$$

$$V = 4x^3 - 48x^2 + 144x$$

for maximum value

$$\frac{dv}{dx} = 0 \quad \frac{d(4x^3 - 48x^2 + 144x)}{dx} = 0$$

$$12x^2 - 96x + 144 = 0 \quad X^2 - 8x + 12 = 0$$

$$\Rightarrow x = 2 \text{ or } 6 \quad x \neq 6$$

$$\text{so } x = 2 \quad \text{for } x = 2$$

$$V = (12 - 2 \times 2)^2 \times 2 \quad V_{\max} = 128$$

So $V \neq 130 \text{ c.c.}$

Ans. D

42. SIMILAR POLYGON

Definition-Two polygons are said to be similar to each other ,if

(A) their corresponding angles are equal, and

(B) the lengths of their corresponding sides are proportional

It should be noted that for the similarity of polygons with more than three sides, the two conditions given above in the definition are independent of each other ,that is either of the two condition without the other is not sufficient for polygons with more than three sides to be similar. In other words , if the corresponding angles of two polygons are equal but lengths of their corresponding sides are not proportional , the polygon need not be similar.

Similarly, , if the corresponding angles of two polygons are not equal but lengths of their corresponding sides are proportional , the polygon need not be similar.

Triangles are special type of polygons, in case of triangles if either of the two conditions holds, then the other holds automatically.

Ans. A

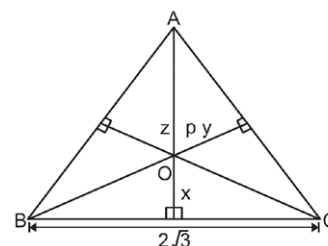
43. $Ar(\triangle ABC) = Ar(\triangle AOB + \triangle AOC + \triangle BOC)$

$$\frac{(2\sqrt{3})^3 \sqrt{3}}{4} = \frac{1}{2} \times 2\sqrt{3} + \frac{1}{2} y \cdot 2\sqrt{3} + \frac{1}{2} z \cdot 2\sqrt{3}$$

$$\frac{12\sqrt{3}}{4} = \frac{1}{2} 2\sqrt{3}[x + y + z]$$

$$3\sqrt{3} = \sqrt{3}[x + y + z]$$

$$3 = x + y + z$$



Ans. C

44. $6765201 = (51)^4$

Ans. A

45. Let the odd no. will be of the form $4q + 1$ or $4q + 3$ then

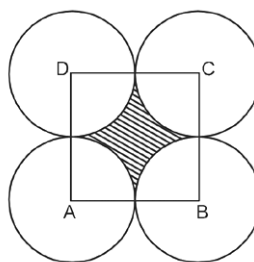
$$(4q + 1)^2 = 16q^2 + 1 + 8q = 8(2q^2 + q) + 1 = 8n + 1$$

$$\text{Or } (4q + 3)^2 = 16q^2 + 9 + 24q = 8[2q^2 + 3q + 1] + 1 = 8n + 1$$

Ans. C

46. Area of shaded region $\delta =$

$$\begin{aligned} & a^2 - \frac{\pi a^2}{4} \\ &= a^2 \left[1 - \frac{\pi}{4} \right] \\ &= a^2 \left[\frac{4 - \pi}{4} \right] \end{aligned}$$



Ans. B

47. $\tan 1^\circ \tan 2^\circ \dots \tan 89^\circ$
 $= \tan 1^\circ \tan 2^\circ \dots \cot 2^\circ \cot 1^\circ = 1$

Ans. B

48. $ax^2 + bx + c = 0$

for real roots

$$b^2 - 4ac \geq 0$$

if $c = 0$

$$\text{then } b^2 \geq 0$$

this is always true.

Ans. D

49. Let the side of tin = a
 So, $U = (a - 2x)^2 x$
 Where x is the side of square which have been cut.
 Similarly $V = (x - 2y)^2 y$
 where y is the side of square which have been cut.
 Ans. D
50. Every parallelogram is a trapezium.
 Ans. B
51. Triangle is uniquely determined when all sides are given.
 Ans. B
52. Let the no. of men = x
 No. of dogs = y
 So, $\frac{x}{10} + \frac{2 \cdot (9x)}{10} + 4y = 77$
 $\frac{19x}{10} + 4y = 77$
 $x = \frac{770 - 40y}{19}$
 For y = 5, x = 30
 So, No of dogs = 5.
 Ans. C
53. Path I is of same lengths as path II. It will be independent of no of semi circles.
 Ans. B
54. Total no. which are divisible by 4 and 6 will be 33
 So Required probability = $\frac{100 - 33}{100} = .67$
 Ans. B
55. $\sqrt{(a-b)^2} + \sqrt{(b-a)^2}$
 $|a - b| + |b - a|$
 This will be positive if $a \neq b$.
 Ans. D
56. Total surface area of all spheres always increases when A solid metal sphere is melted and recantation a number of smaller spheres.
 Ans. B
57. 23.10100100010000... will be irrational number because it's non terminating non repeating.
 Ans. D
58. 14 is the required number because
 $14 = 5 + 5 + 1 + 1 + 1 + 1 = 6$ coins are required.
 Ans. C
59. Median of 1, 3, 4, 6, 7, 8, 8, 9, 12, 15
 Will be any number between 7 and 8 (as per the definition of median given in the question).
 Ans. D

60. $6 = \frac{2S}{\frac{S}{4} + \frac{S}{x}}$

$$\Rightarrow 3 = \frac{4x}{x+4}$$

$$\Rightarrow 3x + 12 = 4x$$

$$\Rightarrow x = 12 \text{ km / h}$$

Ans. C

61. From about 1294 to the time of the French Revolution in 1789, the people of France were expected to strictly follow what were known as “Sumptuary Laws”. The laws tried to control the behaviour of those considered social inferiors, preventing them from wearing certain clothes, consuming certain foods and beverages and hunting game in certain areas.

Ans. C

62. On 3rd March 1933, the Famous enabling Act was passed. This Act established dictatorship in Germany. It gave Hitler all powers to sideline Parliament and rule by decree. All political parties and trade unions were banned except for the Nazi party and its affiliates. The state established complete control over the economy, media, army and Judiciary.

Ans. A

63. Enclosures in England were seen as necessary to make long term investments on land and plan crop rotations to improve the soil. Enclosures also allowed the richer landowners to expand the land under their control and produce more for the market.

Ans. C

64. The most serious source of nationalist tension in Europe after 1871 was the area called the Balkans was a region of geographical and ethnic variation comprising modern day Romania, Bulgaria, Albania, Greece, Mecedonia, Croatia, Bosnia – Herzegovina, Slovenia, Serbia and Montenegro whose inhabitants were broadly known as the Slavs.

Ans. D

65. In Africa, in the 1890s, a fast spreading disease of cattle plague or rinderpest had a terrifying impact on people’s livelihoods and the local economy.

Ans. A

66. “Istri Dharam Vichar” wrote by Shri Ram Chaddha, Kashibaba, a mill worker of Kanpur published ‘Chote Aur Bada ka Sawal’. Rassundari Devi, wrote a story of her life, ‘Amar Jiban’ (My life), that was published in 1876. Jyotiba Phula wrote Gulamgiri, it was based on the caste system.

Ans. C

67. Deeply grateful to print, Martin Luther said, “Printing is the enacted gift of God and the greatest one.”

Ans. A

68. After the Forest Act was enacted in 1865, it was emended twice, once in 1878 and then in 1927. The 1878 Act divided forests into three categories reserved, protected and village forests.

Ans. D

69. In 1933 Hitler said: ‘In my state the mother is the most important citizen.’ Children in Nazi Germany were repeatedly told that women were radically different from men. The fight for equal rights for men and women that had become part of democratic struggles everywhere was wrong and it would destroy society. While boys were taught to be aggressive, masculine and steel hearted, girls were told that they had to become good mothers and rear pure-blooded Aryan children.

Ans. D

70. This history of gymkhana cricket led to first-class cricket being organised on communal and racial lines. ‘The Hindus’ brilliant victory was due more to the judicious and bold step of the Hindu Gymkhana in appointing Mr Vithal, brother of Mr Baloo – premier bowler of India – who is a member of the Untouchable Class to captain the Hindu team. The moral that can be safely drawn from the Hindus’ magnificent victory is that removal of Untouchability would lead to swaraj – which is the prophecy of the Mahatma.’

Ans. D

71. Ambedkar established the Depressed Classes Association in August 1930. Gandhiji began the Civil Disobedience movement in March 1930 and ended in March 1931. In December 1929, Lahore congress adopts the demands for 'Purna Swaraj'.
- Ans. B
72. Both statements are correct.
The Act of union 1707, led the formation of the United Kingdom of Great Britain.
- Ans. B
73. Both statements are true.
Traders and travellers introduced new crops to the land they travelled and Noodles most likely travelled from China through Arab traders to Sicily.
- Ans. D
74. According to Gandhiji, without seeking vengeance or being aggressive, a Satyagrahi could win the battle through non-violence. This could be done by appealing to the conscience of the oppressor.
- Ans. C
75. Both statements are true
On 6th April Gandhiji and his followers reached Dandi, and ceremonially violated the law, manufacturing salt by boiling sea water. This marked the beginning of the Civil Disobedience movement.
- Ans. D
76. In India, Coal is the most abundantly available fossil fuel. It is formed due to compression of plant material over millions of years.
- Ans. C
77. From Gujarat to Arunachal Pradesh there is a time lag of 2 hours. The latitudinal extent influences the duration of the day and night, as one moves from south to north. Arunachal Pradesh lies on the easternmost longitude hence sun rises first in the state.
- Ans. B
78. Long coastline of 7516.6 km, India is dotted with 12 major and 181 medium and minor ports.
- Ans. A
79. The age composition of a population refers to the number of people in different age groups in a country. According to 2001, The age composition of India is :
Adults – 58.7% Aged – 6.9%
Children – 34.4%
- Ans. D
80. During winter season, the northeast trade winds prevail over the country. They blow from land to sea and hence, for most part of the country, it is a dry season. Some amount of rainfall occurs on the Tamil Nadu coast from these winds as, here they blow from sea to land.
- Ans. B
81. The four major ports of India lie on the golden Quadrilateral is Kolkata, Mumbai, Vishakhapatnam and Chennai.
- Ans. D
82. Tuticorin in Tamil Nadu port has a natural harbour and rich hinterland.
- Ans. C
83. India's population has been steadily increasing from 361 million in 1951 to 1028 million in 2001. In 1951 the annual growth rate was 1.25%, in 1981 it was 2.22% and in 2001 it was 1.93% Hence option 4 is correct.
- Ans. D
84. In mountainous area, the decrease in temperature with increasing altitude leads to the corresponding change in natural vegetation.
- Ans. A
85. Ploughing along the contour lines can decelerate the flow of water down the slopes, is called contour ploughing large fields can be divided into strips. Strips of grass are left to grow between the crops. This method called strip cropping.
- Ans. A
86. The Tropic of Cancer passes through the middle of the country. Almost half of the country lying south of the Tropic of Cancer, belongs to the Tropical area. The Himalayas prevent the cold winds from Central Asia from entering the subcontinent. It is because of these mountains that this subcontinent experiences comparatively milder winters as compared to central Asia. Hence Indian Climate is tropical in nature.
- Ans. A

87. This line shows the water divide between east and west flowing rivers.
Ans. C
88. Chotanagpur Plateau marks the further eastward extension drained by the Domodar river.
Ans. D
89. Sex ratio is defined as the number of females per 1000 males in the population. According to 2001, the sex ratio is 933.
Ans. A
90. The pilot has reached at 70°N.
Ans. C
91. Federalism is a system of government in which the power is divided between central authority and various constituent units of the country.
Ans. D
92. According to Indian Constitution, All people are equal before the law and free to chose any religion.
Ans. B
93. According to B.R. Ambedkar, Right to Constitutional Remedies is the “Heart and Soul” of our Constitution.
Ans. D
94. Democracy is better form of government because, it is more accountable form of government and it enhances the dignity of citizens.
Ans. A
95. In 73rd Amendment Act, at least one third of seats in Local Self Government are reserved for women because women constitute nearly half of the population.
Ans. B
96. Low illiteracy level show the category of developed country.
Ans. B
97. In Indian economy between 1973 and 2003, the sectorial share of agriculture in output has decreased for more than its share in total employment.
Ans. D
98. The U.S multinational Google opens it full fledged unit at Gurgaon, Haryana is the example of foreign direct investment.
Ans. C
99. We accept paper money as a medium of exchange because the currency is authorized by the government of the country.
Ans. B
100. World Trade Organisation (WTO) is an organisation whose aim is to liberalise international trade. It is not involved in domestic trade.
Ans. B

MENTAL ABILITY TEST "(STAGE – II)"

ANSWER KEY

1.	A	2.	C	3.	D	4.	B	5.	C	6.	B	7.	D
8.	A	9.	C	10.	C	11.	B	12.	A	13.	B	14.	A
15.	C	16.	B	17.	C	18.	A	19.	D	20.	D	21.	A
22.	C	23.	A	24.	D	25.	A	26.	B	27.	A	28.	D
29.	A	30.	C	31.	A	32.	C	33.	B	34.	A	35.	C
36.	D	37.	C	38.	A	39.	C	40.	B	41.	A	42.	A
43.	C	44.	C	45.	C	46.	B	47.	D	48.	B	49.	D
50.	A	51.	C	52.	C	53.	B	54.	C	55.	B	56.	A
57.	D	58.	C	59.	B	60.	A	61.	B	62.	D	63.	C
64.	C	65.	A	66.	B	67.	C	68.	A	69.	D	70.	B
71.	B	72.	D	73.	B	74.	C	75.	B	76.	C	77.	A
78.	C	79.	B	80.	B	81.	D	82.	D	83.	B	84.	C
85.	A	86.	C	87.	D	88.	D	89.	C	90.	A	91.	B
92.	C	93.	D	94.	A	95.	D	96.	C	97.	C	98.	C
99.	B	100.	C										

SCHOLASTIC APTITUDE TEST "(STAGE – II)"

ANSWER KEY

1. D	2. B	3. D	4. C	5. A	6. B	7. B
8. B	9. C	10. D	11. B	12. D	13. D	14. A
15. C	16. D	17. A	18. D	19. C	20. A	21. C
22. A	23. D	24. B	25. D	26. C	27. D	28. C
29. A	30. B	31. D	32. C	33. C	34. D	35. A
36. C	37. A	38. B	39. C	40. D	41. D	42. A
43. C	44. A	45. C	46. B	47. B	48. D	49. D
50. B	51. B	52. C	53. B	54. B	55. D	56. B
57. D	58. C	59. D	60. C	61. C	62. A	63. C
64. D	65. A	66. C	67. A	68. D	69. D	70. D
71. B	72. B	73. D	74. C	75. D	76. C	77. B
78. A	79. D	80. B	81. D	82. A	83. D	84. A
85. A	86. A	87. C	88. D	89. A	90. B	91. D
92. B	93. D	94. A	95. B	96. B	97. D	98. C
99. B	100. C					