



**ALLEN[®] NATIONAL TALENT SEARCH EXAMINATION
(NTSE-2021) STAGE-1
STATE : WEST BENGAL PAPER : MAT**

Date: 24/01/2021

Max. Marks: 100

SOLUTIONS

Time allowed: 120 mins

1. If there is a common root of the equation $x^2 + ax + b = 0$ and $x^2 + bx + a = 0$ then the value of $a + b$ is

- (a) 1 (b) -1 (c) 0 (d) $\frac{1}{2}$

Ans. (b)

Sol. Let 'x' be the common root.

$$x^2 + ax + b = 0 \quad \dots(1)$$

$$x^2 + bx + a = 0 \quad \dots(2)$$

$$(a - b)x + (b - a) = 0$$

$$x = \frac{(a - b)}{(a - b)} = 1$$

$$x = 1$$

$$\Rightarrow \text{Then, } \{1 + a + b = 0\}$$

$$\text{From equation (1) } \boxed{a + b = -1}$$

2. A principal becomes twice of its amount in 10 years at a certain rate of simple interest. At the same rate of simple interest, that principal becomes thrice of its amount in

- (a) 15 years (b) 20 years (c) 25 years (d) 30 years

Ans. (a)

Sol. Let, $P = x$

$$A = 2x$$

$$2x = \frac{x \times R \times 10}{100} \Rightarrow R = 20\%$$

Then, ATQ

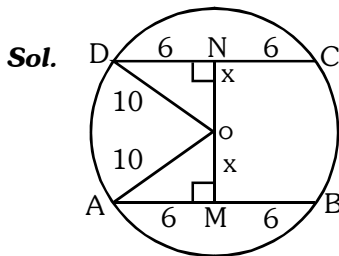
$$3x = \frac{x \times 20 \times T'}{100}$$

$$3 = \frac{T'}{5} \Rightarrow \boxed{T' = 15 \text{ years}}$$

3. The length of each of two parallel chords AB and CD is 12 cm. If the length of the radius of the circle is 10 cm, then the distance between two chords is

- (a) 12 cm (d) 14 cm (c) 16 cm (d) 18 cm

Ans. (c)



$$x = ON = \sqrt{10^2 - 6^2} = 8 \text{ cm} = OM$$

$$MN = 8 + 8 = 16 \text{ cm}$$

4. The ratio of the volumes of two cubes is 1 : 27, the ratio of total surface areas of two cubes is

- (a) 1 : 6 (b) 1 : 8 (c) 1 : 9 (d) 1 : 18

Ans. (c)

Sol.

$$\frac{V_1}{V_2} = \frac{a^3}{A^3} = \frac{1}{27}$$

$$\Rightarrow \boxed{\frac{a}{A} = \frac{1}{3}}$$

$$\frac{S_1}{S_2} = \frac{6a^2}{6A^2} = \left(\frac{1}{3}\right)^2 = \boxed{\frac{1}{9}}$$

5. A box has 210 coins of denomination one-rupee and fifty paise only. The ratio of their respective values is 13 : 11. The number of one-rupee coin is

- (a) 75 (b) 76 (c) 78 (d) 87

Ans. (c)

Sol. Let 1 Rs coins = x

$$\frac{1}{2} \text{ Rs coins} = (210 - x)$$

$$\text{ATQ } \frac{1 \times x}{\frac{1}{2}(210 - x)} = \frac{13}{11}$$

$$\Rightarrow 22x = 2730 - 13x$$

$$\Rightarrow 35x = 2730$$

$$x = 78$$

6. If the volume of two solid right circular cylinders are same and their height are in the ratio 1:3, then the ratio of lengths of radii is

- (a) $\sqrt{3} : 1$ (b) $1 : \sqrt{3}$ (c) $1 : 3$ (d) $3 : 1$

Ans. (a)

Sol. ATQ

$$\pi r_1^2 h_1 = \pi r_2^2 h_2$$

$$\Rightarrow \frac{h_1}{h_2} = \left(\frac{r_2}{r_1}\right)^2 = \frac{1}{3}$$

$$\Rightarrow \frac{r_1}{r_2} = \boxed{\frac{\sqrt{3}}{1}}$$

7. The product of $(2 - \sqrt{3})(2 + \sqrt{5})(4 + 2\sqrt{3})(\sqrt{5} - 2)$ is

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

Ans. (b)

Sol. $= (2 - \sqrt{3})(4 + 2\sqrt{3})(2 - \sqrt{5})(\sqrt{5} - 2)$
 $= (8 + 4\sqrt{3} - 4\sqrt{3} - 6)(5 - 4)$
 $= 2 \times 1 = 2$

8. If $x - y \propto \frac{1}{z}, y - z \propto \frac{1}{x}, z - x \propto \frac{1}{y}$ then sum of three variation constants is

- (a) -1 (b) 0 (c) 1 (d) ± 1

Ans. (b)

Sol. $(x - y)z = k_1$
 $(y - z)x = k_2$
 $(z - x)y = k_3$
 By adding
 $k_1 + k_2 + k_3 = 0$

9. Keeping the radius of a right circular cone same, if the height of its increased thrice, the volume of it will be increased by

- (a) 100% (b) 200% (c) 300% (d) 400%

Ans. (c)

Sol. $V_1 = \frac{1}{3} \pi r^2 h$ (1)

\Rightarrow Also, $V_2 = \frac{1}{3} \pi r^2 h (3h)$ (2)

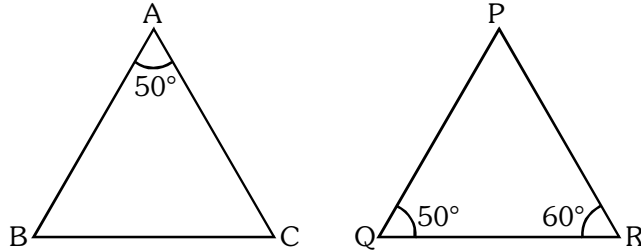
\Rightarrow Volume is increased by 300%

- 10.** In $\triangle ABC$ and $\triangle PQR$, if $\angle A = \angle Q = 50^\circ$, $AB : QP = AC : QR$ and $\angle R = 60^\circ$, then $\angle B$ is
 (a) 50° (b) 60° (c) 70° (d) 80°

Ans. (c)

Sol. Also, $\frac{AB}{QP} = \frac{AC}{QR}$

By SAS criteria
 $\triangle BAC \sim \triangle PQR$
 $\Rightarrow \angle C = \angle R$
 $\Rightarrow \angle B = \angle P$
 $\angle B = 70^\circ$
 $\angle P = 180^\circ - 110^\circ$
 $\angle P = 70^\circ$



- 11.** If the measures of two angles of a triangle are $65^\circ 20' 3''$ and $54^\circ 39' 57''$, then the circular value of third angle is

- (a) π^c (b) $\frac{\pi^c}{2}$ (c) $\frac{\pi^c}{3}$ (d) $\frac{2\pi^c}{3}$

Ans. (c)

Sol. $\angle A = 65^\circ 21' 3''$
 $+\angle B = 54^\circ 39' 57''$

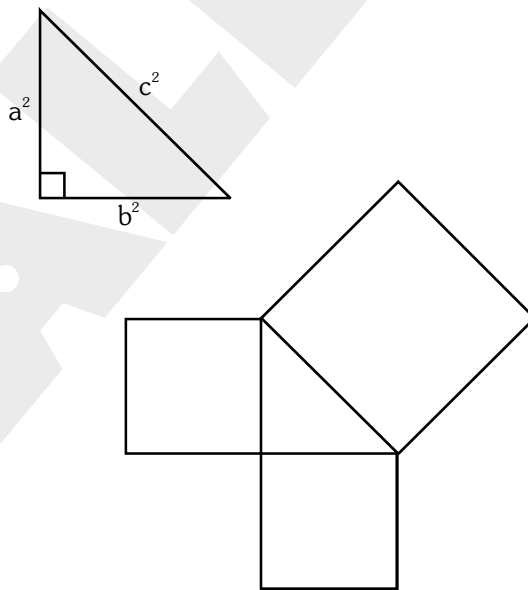
 $\angle A + \angle B = 120$
 $\Rightarrow \angle C = 60^\circ$
 $\angle C = \left(\frac{\pi}{3}\right)^c$

- 12.** Three squares are based on the sides of a right angled triangle. The area of the two smaller ones are 225 sq.cm and 400 sq.cm. What is the area of the third one?

- (a) 484 sq. cm (b) 529 sq. cm (c) 576 sq. cm (d) 625 sq. cm

Ans. (d)

Sol. $a^2 + b^2 = c^2$
 $c^2 = 225 + 400$
 $= 625$



13. If $\sin\theta - \cos\theta = 0$, $0^\circ \leq \theta \leq 90^\circ$ and $\sec\theta + \operatorname{cosec}\theta = x$ then x will be

- (a) 1 (b) 2 (c) $2\sqrt{2}$ (d) $\sqrt{2}$

Ans. (c)

Sol. $\sin\theta = \cos\theta \Rightarrow \tan\theta = 1$

$$\Rightarrow \theta = 45^\circ$$

then, $\sec 45^\circ + \operatorname{cosec} 45^\circ$

$$= \sqrt{2} + \sqrt{2} = 2\sqrt{2}$$

14. If 32 is removed from the data 32, 25, 23, 21, 17, 15, 13, 12, 10 then median will be

- (a) increase by 1.5 (b) decrease by 1 (c) increase by 1 (d) same

Ans. (b)

Sol. 32, 25, 23, 21, 17, 15, 13, 12, 10

Median = 17

Now, 25, 23, 21, 17, 15, 13, 12, 10

$$(\text{Median})_{\text{new}} = \frac{17+15}{2} = 16$$

\Rightarrow Decreased by 1

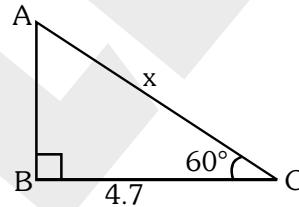
15. The angle of elevation of a ladder leaning against a wall is 60° and the foot of the ladder is 4.7 m away from the wall. The length of the ladder is

- (a) 4.7 m (b) 9.4 m (c) 8.4 m (d) 9.7 m

Ans. (b)

Sol. $\cos 60^\circ = \frac{4.7}{x} = \frac{1}{2}$

$x = 9.4\text{m}$



(Questions 16 – 25)

DIRECTION : In each question 16 to 25 there are two words separated by '!' and other two separated from the first two by the symbol '::'. Find the relation between two sets of words and select one word from the right side of ':' which have the same relation as left set of word of '::'. Fill the circle of the letter denoting your selected answer on the OMR Answer-Sheet.

16. Lion: Roar:: Ass:?

- (a) Trumpet (b) Bray (c) Bark (d) Howl

Ans. (b)

Sol. As lion is related with Roar similarly, Ass is related with Bray. Hence answer is (b)

17. Ocean : Water:: Glacier:?

- (a) Mountain (b) Cave (c) Ice (d) Refrigerator

Ans. (c)

Sol. As ocean is related with water, similarly glacier is related with ice. Hence answer is (c)

18. Arc: Circle:: Line Segment: ?

- (a) Sphere (b) Ellipse (c) Point (d) Square

Ans. (d)

Sol. Arc is related with circle. Similarly line segment is related with square. Hence answer is (d)

19. Court: Justice:: School:?

- (a) Student (b) Teacher (c) Education (d) Building

Ans. (c)

Sol. As you get justice in court. Similarly you get education in school. Hence answer is (c)

20. Protein: Growth :: Carbohydrates: ?

- (a) Immunity (b) Resistance (c) Disease (d) Energy

Ans. (d)

Sol. Protein is related with growth similarly carbohydrates is related with energy. Hence answer is (d)

21. USA: Congress

- (a) Cortes (b) Althing (c) Majlis (d) Storting

Ans. (c)

Sol. USA is related with congress. Similarly. Iron is related with Majlis. Hence answer is (c)

22. Country : President:: State: ?

- (a) Chief Minister (b) Minister of State (c) Speaker (d) Governor

Ans. (d)

Sol. As president is related with country. Similarly, Governor is related with state. Hence answer is (d)

23. AB: ZY:: CD:?

- (a) UV (b) WX (c) VU (d) XW

Ans. (d)

Sol.
$$\begin{array}{ccccccc} A & B & : & Z & Y & : & : & C & D & : & X & W \\ \downarrow & \downarrow & & \downarrow & \downarrow & & & \downarrow & \downarrow & & \downarrow & \downarrow \\ \text{opposite letters} & & & \text{opposite letters} & & & & & & & & \end{array}$$

Hence answer is (d)

24. 42:56:: 110:?

- (a) 148 (b) 184 (c) 132 (d) 124

Ans. (c)

Sol. $7^2 - 7 : 8^2 - 8 :: 11^2 - 11 : 12^2 - 12$

Hence answer is (c)

25. 64: 144: 256:?

- (a) 484 (b) 412 (c) 625 (d) 402

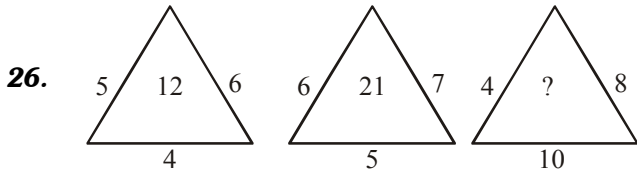
Ans. (NA)

Sol. It should be : $8^2 : 12^2 :: 16^2 : \boxed{20^2}$

But no option. Is given as 400.

(Questions 26-55)

DIRECTION : In questions 26-55, numbers are placed in figures on the basis of some rules. One place in the figure is indicated by the interrogation sign(?). Find out the correct alternative to replace the question mark and indicate your answer by filling the circle of the corresponding letter of alternatives in the OMR Answer-Sheet.



- (a) 22 (b) 32 (c) 30 (d) 23

Ans. (b)

Sol. Multiply all outer number divide by 10.

27.

21	56	70
45	87	84
115	180	?

- (a) 120 (b) 130 (c) 140 (d) 150

Ans. (b)

Sol. $(56 - 21) \times 2 = 70$

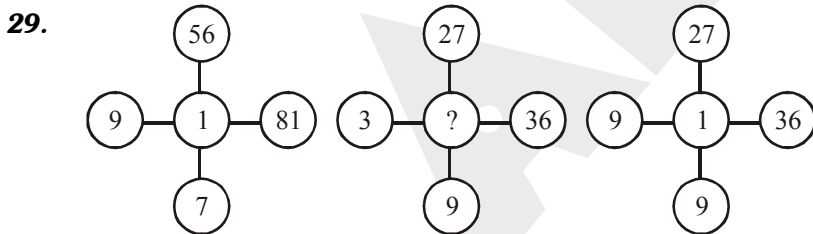
28.

7	14	4
4	12	9
6	24	?

- (a) 20 (b) 18 (c) 16 (d) 14

Ans. (c)

Sol. $(7 \times 4) \div 2 = 14;$ $(9 \times 4) \div 3 = 12;$ $(6 \times 16) \div 4 = 24$

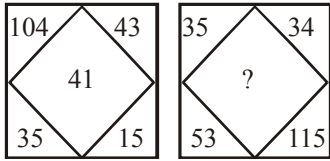


- (a) 9 (b) 8 (c) 1 (d) 7

Ans. (a)

Sol. $(81 \div 9) - (56 \div 7) = 1$

30.



(a) 51

(b) 61

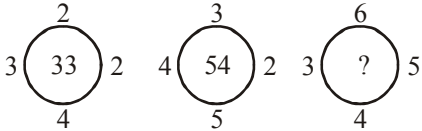
(c) 63

(d) 54

Ans. (c)

Sol. $(104 + 15) - (35 + 43) = 41$.

31.



(a) 77

(b) 78

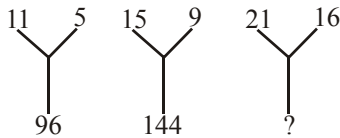
(c) 86

(d) 88

Ans. (c)

Sol. All outer numbers square sum.

32.



(a) 185

(b) 165

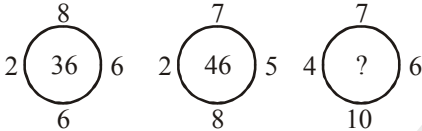
(c) 175

(d) 195

Ans. (a)

Sol. Top numbers square's difference.

33.



(a) 46

(b) 42

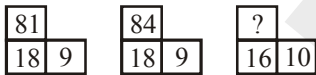
(c) 43

(d) 44

Ans. (a)

Sol. $(8 \times 6) - (6 \times 2) = 36$.

34.



(a) 78

(b) 80

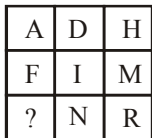
(c) 84

(d) 82

Ans. (b)

Sol. $(81 \div 9) \times 2 = 18$

35.



(a) J

(b) K

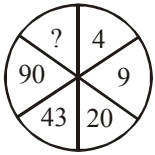
(c) S

(d) P

Ans. (b)

Sol. In column letters positions difference is +3, +4.

36.

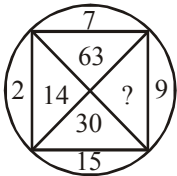


- (a) 146 (b) 126 (c) 175 (d) 185

Ans. (d)

Sol. Pattern in clockwise from 4 = $\times 2+1, \times 2+2, \times 2+3, \dots$

37.



- (a) 18 (b) 33 (c) 135 (d) 145

Ans. (c)

Sol. $9 \times 7 = 63; 7 \times 2 = 14, 2 \times 15 = 30; 15 \times 9 = 135.$

38.

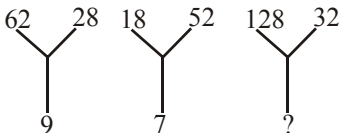
1	7	9
2	14	12
3	105	?

- (a) 117 (b) 115 (c) 127 (d) 112

Ans. (a)

Sol. $(14 \times 7) + 7 = 105.$

39.



- (a) 13 (b) 16 (c) 15 (d) 17

Ans. (b)

Sol. Top numbers sum $\div 10 =$ Bottom number.

40.

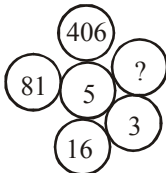
?	1	2
21	22	40
1	2	5
20	23	43

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

Ans. (a)

Sol. $40 + (5 - 2) = 43$

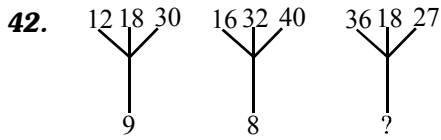
41.



- (a) 1 (b) 731 (c) 1625 (d) 2031

Ans. (d)

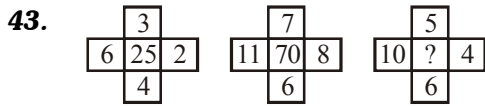
Sol. $3 \times 5 + 1 = 16; \quad 16 \times 5 + 1 = 81; \quad 81 \times 5 + 1 = 406; \quad 406 \times 5 + 1 = 2031$



- (a) 6 (b) 9 (c) 12 (d) 18

Ans. (b)

Sol. H.C.F. of top numbers given in bottom.



- (a) 72 (b) 73 (c) 74 (d) 75

Ans. (b)

Sol. $(6^2 + 3^2) - (4^2 + 2^2) = 25$

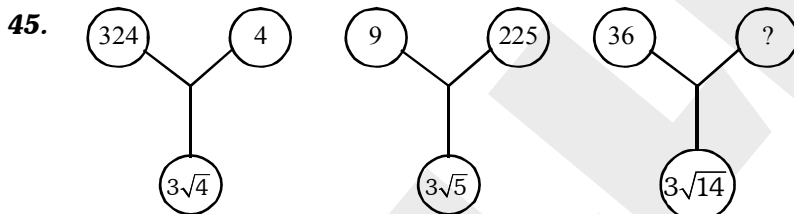
44.

4C	3B	2A
8A	?	14B
2C	8A	7B

- (a) 16A (b) 20B (c) 22D (d) 24C

Ans. (d)

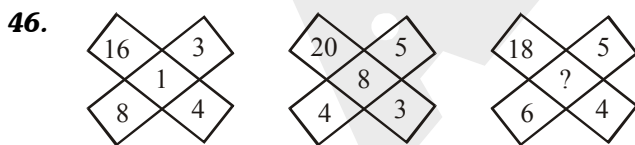
Sol. For numbers in column top number multiply by bottom number = middle number.
For alphabet, Alphabet A, B, C comes once in every row.



- (a) 414 (b) 424 (c) 441 (d) 484

Ans. (c)

Sol. $\sqrt{324} \times \sqrt{4} = 3^2 \times 4$

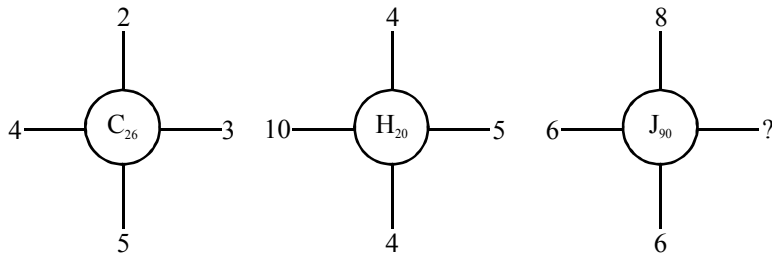


- (a) 9 (b) 7 (c) 5 (d) 3

Ans. (d)

Sol. $(16 - 4) - (8 + 3) = 1$

47.



- (a) 8 (b) 9 (c) 4 (d) 7

Ans. (c)

Sol. $\{2 + 3(C) + 5\} \times 3 - 4 = 26$.

48.

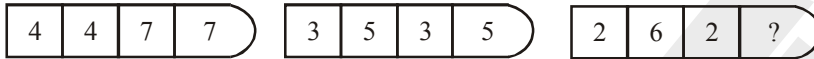
A ₂	C ₄	E ₆
G ₃	I ₅	?
M ₅	O ₉	Q ₁₄

- (a) K₇ (b) M₈ (c) K₈ (d) M₇

Ans. (c)

Sol. For numbers in column $2 + 3 = 5$.
For alphabets in row pattern $+2, +2$.

49.

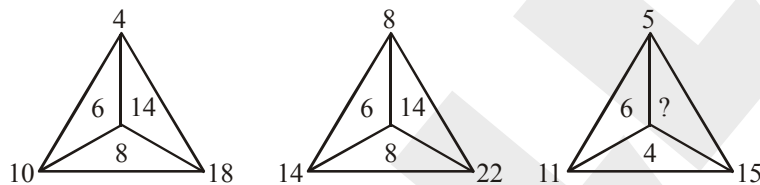


- (a) 2 (b) 3 (c) 6 (d) 4

Ans. (c)

Sol. In any figure : 1st number \times 4th number = 2nd number \times 3rd number

50.

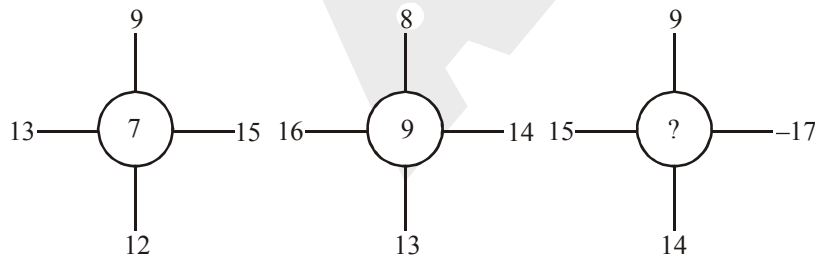


- (a) 10 (b) 14 (c) 8 (d) 6

Ans. (a)

Sol. Vertices number difference written on edges.

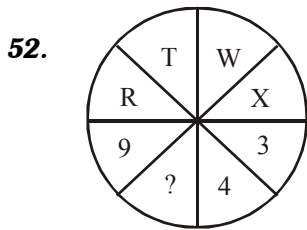
51.



- (a) 8 (b) 7 (c) 9 (d) 6

Ans. (c)

Sol. $13 - 12 = 1$
 $15 - 9 = 6$
 $= 7$
 $16 - 13 = 3$
 $14 - 8 = 6$
 $= 9$
 $15 - 14 = 1$
 $17 - 9 = 8$
 $= 9$



- (a) 7 (b) 6 (c) 8 (d) 5

Ans. (a)

Sol. $R(18) + 9 = 27$ (reverse position)

53.

$\sqrt{4}$	$\frac{1}{2}$	$\frac{3}{2}$
$\sqrt{9}$	$\frac{4}{3}$	$\frac{5}{3}$
$\sqrt{16}$?	$\frac{11}{4}$

- (a) $\frac{4}{3}$ (b) $\frac{3}{2}$ (c) $\frac{5}{4}$ (d) $\frac{3}{4}$

Ans. (c)

Sol. Finding square root of 1st column.

2	1/2	3/2
3	4/3	5/3
4	?	11/4

Column 1, value is in denominator of col 2 and Col. 3 of Row 1

$$2 \rightarrow \frac{1}{2} \rightarrow \frac{3}{2}$$

$$3 \rightarrow \frac{4}{3} \rightarrow \frac{5}{3}$$

$$4 \rightarrow \frac{5}{4} \rightarrow \frac{11}{4}$$

Option (c) is correct denominator should be 4

54.

1	2	3	4	5
0	4	18	48	?

(a) 72

(b) 68

(c) 100

(d) 120

Ans. (c)

Sol. Multiplying Row 1 by No's to get Row 2

$$1 \times 0 = 0$$

$$2 \times 2 = 4$$

$$3 \times 6 = 18$$

$$5 \times 20 = 100$$

$$\begin{array}{cccccc}
 0, & 2, & 6, & 12, & 20 \\
 \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\
 & +2 & +4 & +6 & +8
 \end{array}$$

Option (c) answer

55.

BD ₆	CE ₈	DF ₁₀
EG ₁₂	FH ₁₄	GI ₁₆
HJ ₁₈	IK ₂₀	?

(a) IJ₁₈

(b) JL₁₂

(c) JK₂₄

(d) JL₂₂

Ans. (d)

Sol. Continuous series of alphabets.

1st letter

B → C → D

E → F → G

H → I → J

2nd letter

D → E → F

G → H → I

J → K → L

3rd number (+2)

6 → 8 → 10

12 → 14 → 16

18 → 20 → 22

JL₂₂

Option (d) answer

(Questions 56-70)

DIRECTION : In each of the following questions 56 to 70, a number series is given with one term missing. Choose the correct alternative that will continue the same pattern and answer on the OMR Answer Sheet by filling the circle.

56. 95, 94, 92, 89, 85, 80, ?

- (a) 78 (b) 76 (c) 74 (d) 72

Ans. (c)

Sol. 95, 94, 92, 89, 85, 80, 74
└─┬─┘└─┬─┘└─┬─┘└─┬─┘└─┬─┘└─┬─┘
-1 -2 -3 -4 -5 -6

Correct option (c)

57. 0, 6, 24, 60, 120, 210, ?

- (a) 260 (b) 275 (c) 310 (d) 336

Ans. (d)

Sol. 0, 6, 24, 60, 120, 210, _____.

$$\begin{aligned} 1^3 - 1 &= 0 & 2^3 - 2 &= 6. \\ 3^3 - 3 &= 24 & 4^3 - 4 &= 60 \\ 5^3 - 5 &= 120 & 6^3 - 6 &= 216 \\ 7^3 - 7 &= 343 - 7 = 336 \end{aligned}$$

Correct option (d) answer.

58. 720, 360, 120, 30, 6, ?

- (a) 0 (b) 1 (c) 2 (d) 3

Ans. (b)

Sol. 720, 360, 120, 30, 6, 1
└─┬─┘└─┬─┘└─┬─┘└─┬─┘└─┬─┘
÷2 ÷3 ÷4 ÷5 ÷6

Correct option (b)

59. 34, 18, 10, 6, 4, ?

- (a) 3 (b) 2 (c) 1 (d) 0

Ans. (a)

Sol. 34, 18, 10, 6, 4, 3
└─┬─┘└─┬─┘└─┬─┘└─┬─┘└─┬─┘
-16 -8 -4 -2 -1

Correct option (a)

60. 107, 97, 82, 62, ?

- (a) 42 (b) 47 (c) 37 (d) 39

Ans. (c)

Sol. 107, 97, 82, 62, 37
└─┬─┘└─┬─┘└─┬─┘└─┬─┘
-10 -15 -20 -25
└─┬─┘└─┬─┘└─┬─┘
Different 5 5 5

Correct option (c)

61. 1, 2, 5, 12, 27, 58, ?

(a) 116

(b) 121

(c) 125

(d) 127

Ans. (b)

Sol. 1, 2, 5, 12, 27, 58, _____

$$1 \times 2 + 0 = 2$$

$$2 \times 2 + 1 = 5$$

$$5 \times 2 + 2 = 12$$

$$12 \times 2 + 3 = 27$$

$$27 \times 2 + 4 = 58$$

$$58 \times 2 + 5 = 121$$

Correct option (b)

62. $\frac{2}{\sqrt{5}}, \frac{3}{5}, \frac{4}{5\sqrt{5}}, \frac{5}{25}, ?$

(a) $\frac{6}{5\sqrt{5}}$

(b) $\frac{6}{25\sqrt{5}}$

(c) $\frac{6}{125}$

(d) $\frac{7}{25}$

Ans. (b)

Sol. $\frac{2}{\sqrt{5}}, 3, \frac{4}{5\sqrt{5}}, \frac{5}{25}$

Numerator

$$2 \xrightarrow{+1} 3 \xrightarrow{+1} 4 \xrightarrow{+1} 5 \xrightarrow{+1} 6$$

Denominator

(multiply by $\sqrt{5}$)

$$\begin{array}{ccccccc} \sqrt{5} & 5 & 5\sqrt{5} & 25 & 25\sqrt{5} & & \\ \downarrow & \uparrow & \downarrow & \uparrow & \downarrow & \uparrow & \\ \times \sqrt{5} & \times \sqrt{5} & \times \sqrt{5} & \times \sqrt{5} & \times \sqrt{5} & & \end{array}$$

$$\frac{6}{25\sqrt{5}}$$

Correct Option (b)

63. 3, 12, 27, 48, 75, 108, ?

(a) 118

(b) 135

(c) 147

(d) 152

Ans. (c)

Sol. $3, 12, 27, 48, 75, 108, 147$

$$\begin{array}{ccccccc} \downarrow & \uparrow & \downarrow & \uparrow & \downarrow & \uparrow & \downarrow & \uparrow \\ +9 & +15 & +21 & +27 & +33 & +39 & & \\ \downarrow & \uparrow & \downarrow & \uparrow & \downarrow & \uparrow & \downarrow & \uparrow \\ +6 & +6 & +6 & +6 & +6 & & & \end{array}$$

Correct option (c)

64. 840, 168, 42, 14, ?

(a) 2

(b) 3

(c) 5

(d) 7

Ans. (d)

Sol. 840, 168, 42, 14, 7
┌───┐ ┌───┐ ┌───┐ ┌───┐
↑ ↑ ↑ ↑
÷5 ÷4 ÷3 ÷2

Correct option (d)

65. 4, 5, 7, 11, 19, 35, ?

(a) 47

(b) 57

(c) 67

(d) 77

Ans. (c)

Sol. 4, 5, 7, 11, 19, 35, _____

$$4 \times 2 - 3 = 5$$

$$5 \times 2 - 3 = 7$$

$$7 \times 2 - 3 = 11$$

$$11 \times 2 - 3 = 19$$

$$19 \times 2 - 3 = 35$$

$$35 \times 2 - 3 = 67$$

Correct option (c)

66. 11, 10, 101, 100, 1001, 1000, ?

(a) 10000

(b) 10001

(c) 11001

(d) 10011

Ans. (b)

Sol. 11, 10, 101, 100, 1001, 1000, ...

$$11 - 1 = 10$$

$$10 \times 10 + 1 = 101$$

$$101 - 1 = 100$$

$$100 \times 10 + 1 = 1001$$

$$1001 - 1 = 1000$$

$$1000 \times 10 + 1 = 10001$$

67. 2, 7, 27, 107, 427, ?

(a) 1262

(b) 1707

(c) 4027

(d) 4207

Ans. (b)

Sol. 2, 7, 27, 107, 427,
┌──┐ ┌──┐ ┌──┐ ┌──┐
↑ ↑ ↑ ↑
+5 +20 +80 +320
┌──┐ ┌──┐ ┌──┐ ┌──┐
↑ ↑ ↑ ↑
×4 ×4 ×4 ×4

$$320 \times 4 = 1280$$

$$427 + 1280 = 1707$$

68. 3, 8, 13, 24, 41, ?

- (a) 70 (b) 75 (c) 80 (d) 85

Ans. (a)

Sol. 3, 8, 13, 24, 41

$$(3 + 8) + 2 = 13$$

$$(8 + 13) + 3 = 24$$

$$(13 + 24) + 4 = 41$$

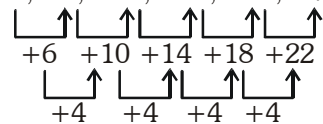
$$(24 + 41) + 5 = 70$$

69. 2, 8, 18, 32, 50, ?

- (a) 60 (b) 66 (c) 72 (d) 82

Ans. (c)

Sol. 2, 8, 18, 32, 50, 72



correct option (c)

70. 4, 18, ?, 100, 180, 294

- (a) 38 (b) 42 (c) 48 (d) 50

Ans. (c)

Sol. 4, 18, ____, 100, 180, 294

$$2^2 \times 1 = 4$$

$$3^2 \times 2 = 18$$

$$4^2 \times 3 = 48$$

$$5^2 \times 4 = 100$$

$$6^2 \times 5 = 180$$

$$7^2 \times 6 = 294$$

(Questions 71-80)

DIRECTION : In each of the questions 71 to 80 there are four items, three of which are alike by some means or other while one is out of the class. Find out the odd items and indicate your answer by filling the circle of the corresponding letter on the OMR Answer-Sheet.

71. (a) Bar (b) Pie (c) Rectangle (d) Pictogram

Ans. (b)

Sol. Pie is circular representation of data rest are rectangular/tabular format.

72. (a) Hygrometer (b) Hydrometer (c) Diameter (d) Barometer

Ans. (c)

Sol. Except diameter, others are machines/instruments to measure.

73. (a) Sun (b) Earth (c) Moon (d) Universe

Ans. (d)

Sol. Except universe, other are part of universe correct option (d).

74. (a) Iron (b) Mercury (c) Copper (d) Aluminium

Ans. (b)

Sol. Only mercury is liquid metal.

75. (a) Seismograph (b) Anemometer (c) Richter Scale (d) Epicentre

Ans. (b)

Sol. Except Anemometer others are related to Earthquake.

76. (a) Wood (b) Cork (c) Stone (d) Paper

Ans. (c)

Sol. ∴ All others are related to trees.

77. (a) SARS (b) COVID-19 (c) EBOLA (d) Typhoid

Ans. (d)

Sol. All other are virus infections.

78. (a) Herpes virus (b) Papilloma virus (c) Corona virus (d) Pox virus

Ans. (c)

Sol. All other infections are affect our skin.

79. (a) Arc (b) Diagonal (c) Chord (d) Diameter

Ans. (b)

Sol. All other are related to circle only.

80. (a) BCIUX (b) BDAYO (c) BEMUZ (d) BQMPX

Ans. (d)

Sol. ∴ All other option alphabets place value

Sum is prime number but in

BQ MPX $\rightarrow 2 + 17 + 13 + 16 + 24 = 72$.

Which is a composit number.

(Questions 81-85)

DIRECTION : Choose the correct one and give the answer by filling the circle of the letter denoting your selected answer on the OMR Answer Sheet.

81. Ibrahim ranks 8th in a class of 35 students. What is his rank from the last?

(a) 26th (b) 27th (c) 29th (d) 28th

Ans. (d)

Sol. Total students = 35

Ibrahim Rank = 8th

So Students after him is class = 27

So his rank from last = 28th

82. If the digit 12 of a clock is pointing towards East, then in which direction will digit 3 point?

(a) West (b) South (c) North (d) South-West

Ans. (b)

Sol. By observation.

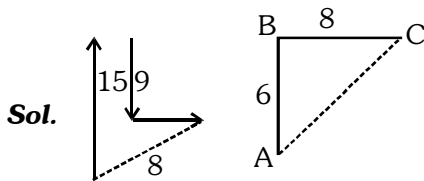
- 83.** Which one is the most accurate laboratory methods for detecting COVID-19 corona virus?
 (a) RT-PCR (b) RDT (c) PCR (d) Serology Test

Ans. (a)

Sol. (A) RT – PCR

- 84.** Rahim walks 15km towards North. From there he walks 9km towards South. Then he walks 8km towards East. How far and in which direction is he now from his starting point?
 (a) 7km North-East (b) 10km North-East (c) 10km South-West (d) 7km South-East

Ans. (b)



$$\begin{aligned}
 AC &= \sqrt{AB^2 + BC^2} \\
 &= \sqrt{6^2 + 8^2} \\
 &= \sqrt{36 + 64} \\
 &= \sqrt{100} = 10
 \end{aligned}$$

Option (b) 10 km North-East.

- 85.** If 1st January, 2008 is Tuesday then what day of the week lies on 1st January, 2009?
 (a) Wednesday (b) Thursday (c) Sunday (d) Monday

Ans. (b)

Sol. If 1st 2008 is Tuesday so 1st Jan 2009 is Thursday.

(Questions 86-90)

DIRECTION : Here the four fundamental operations +, −, × and ÷ are represented by symbols different from the usual one. You have to solve the problem by substituting the real symbol accordingly and indicate your 5 answer by filling the Circle of the letter denoting your selected answer on OMR Answer sheet.

- 86.** If L denotes ×, M denotes ÷, P denotes + and Q denotes −, then 7P24M8Q6M2L3 =
 (a) 1 (b) 2 (c) 3 (d) 4

Ans. (a)

Sol. 7 P 24 M 8 Q 6 M 2 L 3
 After putting signs are get
 $7 + 24 \div 8 - 6 \div 2 \times 3$
 $7 + 3 - 3 \times 3$
 $7 + 3 - 9 = 10 - 9 = 1$

- 87.** If A means '−', B means '÷', C means '+' and D means '×', then 15B3C24A12D2 =
 (a) 4 (b) 2 (c) 5 (d) 3

Ans. (c)

Sol. 15 B 3 C 24 A 12 D 2
 $15 \div 3 + 24 - 12 \times 2$
 $5 + 24 - 12 \times 2$
 $5 + 24 - 24 = 5$

88. If A for '+', M for '×', D for ÷, G for '>', L for '<' then which of the following will be logically correct?
 (a) 4A3M2L4D2M6 (b) 4A3M2D3L4M6 (c) 4A5M4L6D2A8 (d) 4A5D3G6A2M3

Ans. (a)

Sol. 4 A 3 M 2 L 4 D 2 M 6
 $4 + 3 \times 2 < 4 \div 2 \times 6$
 $4 + 6 < 2 \times 6$
 $10 < 12$

89. Select the Correct combination of mathematical signs to replace * signs and to balance the given equation:
 $(5 * 6) * 5 * 8 = 14$

(a) ×, +, ÷ (b) ×, ÷, + (c) +, ×, ÷ (d) +, ÷, ×

Ans. (b)

Sol. Given equation $(5 * 6) * 5 * 8 = 14$ when we put option b in it

$(5 \times 6) \div 5 + 8 = 14$
 $(30) \div 5 + 8 = 14$
 $6 + 8 = 14$
 $14 = 14$

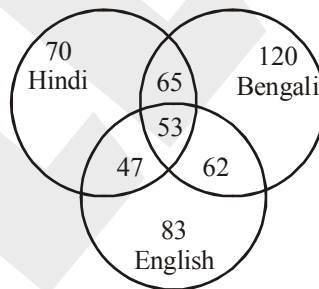
90. If '+' means '÷', '-' means '×', '÷' means '+' and '×' means '-', then $36 \times 12 + 4 \div 6 + 2 - 3 =$
 (a) 28 (b) 32 (c) 39 (d) 42

Ans. (d)

Sol. $36 \times 12 + 4 \div 6 + 2 - 3$
 $36 - 12 \div 4 + 6 \div 2 \times 3$
 $36 - 3 + 9$
 42

(Questions 91-95)

DIRECTION : The diagram shows the survey on a sample of 500 persons with respect to their knowledge of Bengali, Hindi and English.



91. How many persons know the Bengali and English Language but not know the Hindi Language?
 (a) 53 (b) 62 (c) 65 (d) 37

Ans. (b)

Sol. Persons known the bengali and english language but not know the hindi = 62

92. How many persons know all the three Languages?

(a) 65 (b) 62 (c) 53 (d) 47

Ans. (c)

Sol. By observation 53

93. How many persons who do not know Hindi Language?

- (a) 265 (b) 200 (c) 255 (d) 201

Ans. (a)

Sol. Persons who do not know Hindi language

$$= 120 + 83 + 62$$

$$= 265$$

94. What is the ratio of those who know all the three Languages to those who do not know Hindi Language?

- (a) $\frac{3}{5}$ (b) $\frac{2}{5}$ (c) $\frac{1}{5}$ (d) $\frac{4}{5}$

Ans. (c)

Sol. Persons who know all three language = 53

Person who do not know Hindi = 265

$$\text{Ratio} = \frac{53}{265} = \frac{1}{5}$$

95. What is the ratio of those who know only Bengali Language to those who do not know Bengali Language?

- (a) 2 : 5 (b) 3 : 5 (c) 4 : 5 (d) 1 : 5

Ans. (b)

Sol. Persons who know only bengali = 120

Who do not know bengali = 200

$$\text{Ratio} = \frac{120}{200} = \frac{3}{5}$$

(Questions 96 and 97)

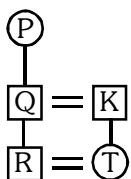
Direction : Choose the correct one.

96. If $M \times N$ means M is the daughter of N; $M + N$ means M is the father of N; $M \div N$ means M is the Mother of N and $M - N$ means M is the brother of N then $P \div Q + R - T \times K$ indicates which relation of P to K ?

- (a) Daughter-in-Law (b) Sister-in-Law (c) Mother-in-Law (d) Aunt

Ans. (c)

Sol. $P \div Q + R - T \times K$

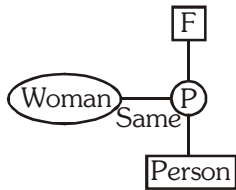


97. Pointing to a person, a man said to a woman, "His mother is the only daughter of your father". How was the woman related to the person?

- (a) Wife (b) Daughter (c) Aunt (d) Mother

Ans. (d)

Sol. Mother



(Question 98-100)

Direction : Read the following information and answer the questions given below.

There are six children playing football namely A, B, C, D, E and F. A and E are brother; F is the sister of E; C is the only son of A's uncle; B and D are the daughters of the brother of C's father.

98. How many female players are there?

- (a) Two (b) Three (c) Four (d) Five

Ans. (b)

Sol. Two figures are possible]



Three Female → F, B, D

99. How C is related to F?

- (a) Brother (b) Uncle (c) Son (d) Cousin

Ans. (d)

Sol. Cousin

100. How D is related to A?

- (a) Cousin (b) Sister (c) Niece (d) Uncle

Ans. (a or b)

Sol. Cousin or sister