

NATIONAL TALENT SEARCH EXAMINATION-2019-20, GUJARAT

MENTAL ABILITY TEST (MAT) PAPER

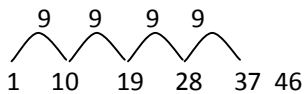
Instruction : In each of the following question, numbers have been organized in a definite number series wherein one number is missing and a question mark (?) is given in its place. Find out the missing number by choosing the correct option. (Q.No. 1 to 10)

1. 1,4,13,40, ?
(A) 94 (B) 120 (C) 111 (D*) 121



Sol.

2. 1,10,19,28,?,46.
(A) 33 (B*) 37 (C) 34 (D) 38



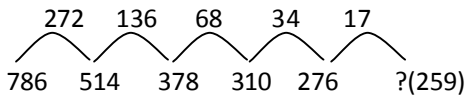
Sol.

3. 12,144,1728,?
(A*) 20,736 (B) 20,216 (C) 20,466 (D) 20,376

12^1	12^2	12^3	12^4
12	144	1728	20736

Sol.

4. 786,514,378,310,276,?
(A) 249 (B) 260 (C*) 259 (D) 250



Sol.

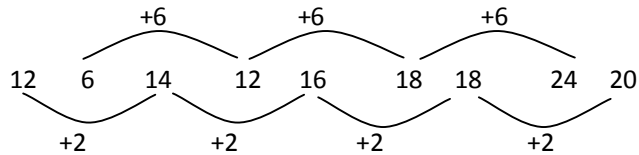
5. 2, 13, 67, 271, ?, 1639.
(A) 1067 (B) 1177 (C*) 817 (D) 1371

Sol.
 $2 \times 6 + 1 = 13$
 $13 \times 5 + 2 = 67$
 $67 \times 4 + 3 = 271$
 $271 \times 3 + 4 = 817$
 $817 \times 2 + 1 = 1639$

6. 3,8,20,46,?
(A) 261 (B) 140 (C) 189 (D*) 100

Sol.
 $3 \times 2 + 2 = 8$
 $8 \times 2 + 4 = 20$
 $20 \times 2 + 6 = 46$
 $46 \times 2 + 8 = 100$

7. 12, 6, 14, 12, 16, 18, 18, ?, ?.
 (A) 22, 20 (B) 24, 20 (C) 20, 22 (D) 20, 24



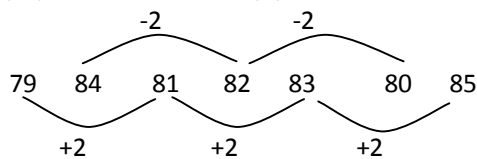
Sol.

8. 1728, 2744, 4096, 5832, ?, 10648.
 (A) 9261 (B*) 8000 (C) 6859 (D) 6400

12^3	14^3	16^3	18^3	20^3
1728	2744	4096	5832	8000

Sol.

9. 79, 84, 81, 82, 83, ?, ?
 (A*) 80, 85 (B) 84, 85 (C) 85, 84 (D) 85, 80



Sol.

10. 88, 64, 24, ?
 (A) 10 (B) 142 (C*) 8 (D) 14

Sol. $8 \times 8 = 64$
 $6 \times 4 = 24$
 $2 \times 4 = 8$

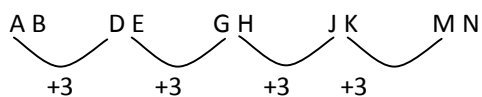
Instruction : In each of the following question, English alphabets and / or numbers have been organized in a definite number series wherein an alphabet or a group of alphabets is missing and a question mark (?) is given in its place. Find out the missing term by choosing the correct option. (Q.No. 11 to 20)

11. A, F, K, P, U, Z, E, J, O, ?
 (A) R (B) S (C*) T (D) Q

1	6	11	16	21	26	5	10	15	20
A	F	K	P	U	Z	E	J	O	T

Sol.

12. AB, DE, GH, JK, ?
 (A) LM (B) NO (C*) MN (D) PQ

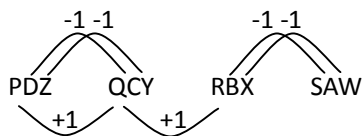


Sol.

13. AA, fff, KK, ppp, U, ?
 (A) UU (B) U (C) V (D) w

Sol. **Bonus**

14. PDZ, ?, RBX, SAW
 (A*) QCY (B) OCY (C) QCV (D) QYD

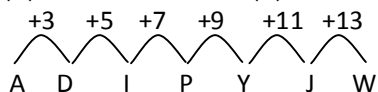


Sol.

15. D, H, Y, E, Y, Y, E, Y, H, ?
 (A) 1 (B) I (C) E (D*) D

Sol. Reverse ,DHYEY → YEYHD

16. A,D,I,P,Y,J, ?
 (A) Q (B) T (C*) W (D) R



Sol.

17. $\frac{B}{2}, \frac{E}{5}, \frac{I}{9}, \frac{N}{14}, ?$
 (A) $\frac{S}{19}$ (B) $\frac{R}{18}$ (C) $\frac{I}{20}$ (D) $\frac{U}{21}$

Sol. **Bonus**

18. AB,I,BC,6,CD,12,DE,?.
 (A) 16 (B) 14 (C) 18 (D) 20

Sol. **Bonus**

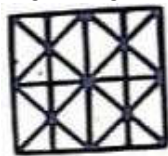
19. O,T,T,F,F,S,S,E,N,?
 (A) O (B*) T (C) F (D) S

Sol. One , Two , Three Ten

20. J,F,M,A,M,J,J,?
 (A) J (B) F (C) M (D*) A

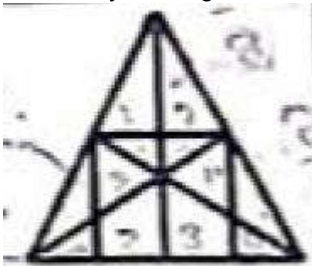
Sol. Jan , Feb , March August

21. How many line segments are there in the given figure ?



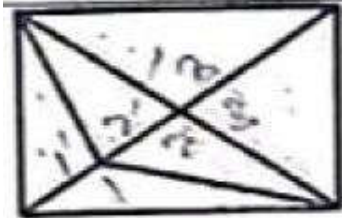
- (A) 11 (B*) 14 (C) 16 (D) 17

22. How many line segments are there in the given figure?



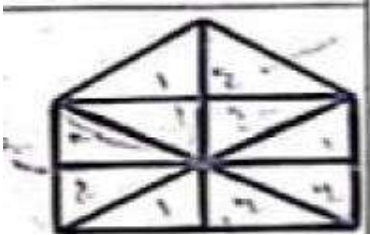
- (A) 8 (B*) 9 (C) 10 (D) 11

23. How many triangles are there in the given figure ?



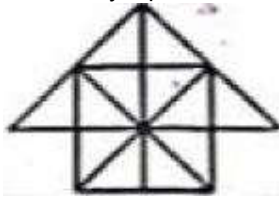
- (A) 11 (B) 13 (C*) 15 (D) 17

24. How many triangles are there in the given figure ?



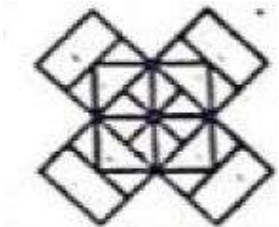
- (A) 10 (B) 19 (C*) 21 (D) 23

25. How many squares are there in the given figure ?



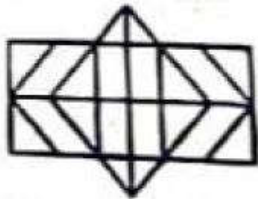
- (A) 4 (B) 5 (C*) 6 (D) 7

26. How many squares are there in the given figure ?



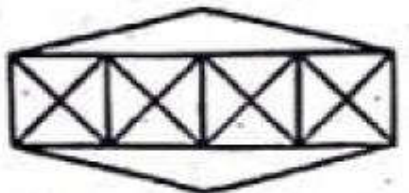
- (A*) 18 (B) 14 (C) 20 (S) 22

27. How many rectangles are there in the given figure ?



- (A) 28 (B) 32 (C) 14 (D*) 30

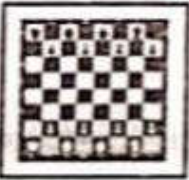
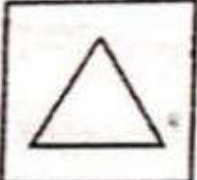
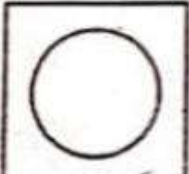
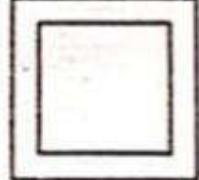
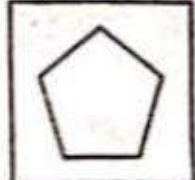
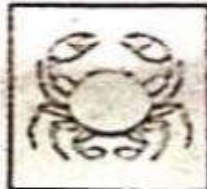
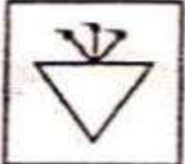
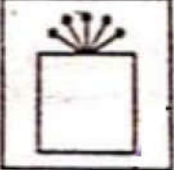
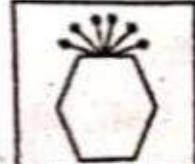
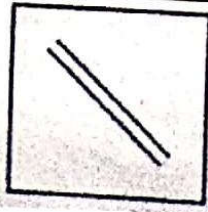
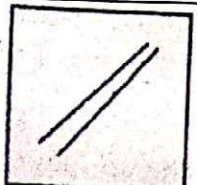
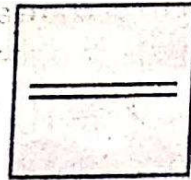
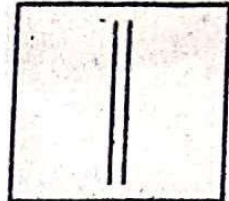
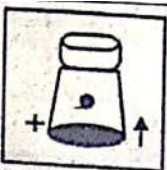
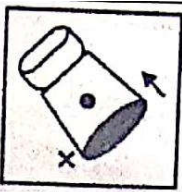
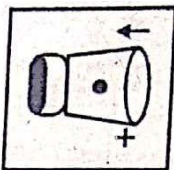
Instruction : (Question No. 28 to 30) Answer the questions on the basis of given figure.



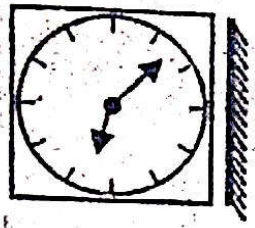
28. How many line segments are there in the given figure ?
 (A) 18 (B) 19 (C) 17 (D) 20
29. How many triangles are there in the given figure?
 (A) 40 (B) 36 (C) 38 (D) 42
30. How many squares are there in the given figure?
 (A) 5 (B) 9 (C) 8 (D) 7

Instruction: (Question no. 31 to 40) Four figures are given in question no. 31 to 40. One of the figure differ from the rest. Find the out the figure which is different from the rest of the figures.

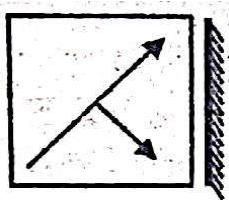
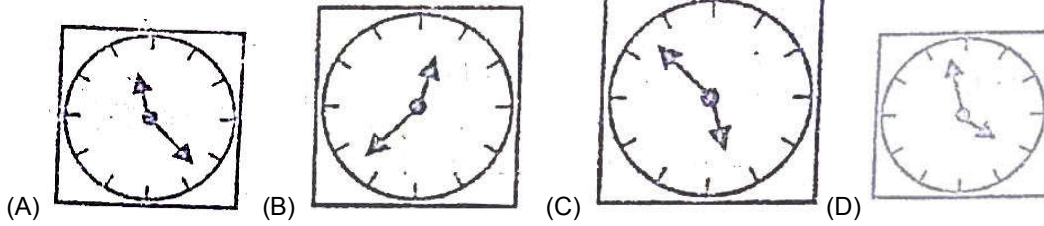
31. (A) (B) (C) (D)
32. (A) (B) (C) (D)
33. (A) (B) (C) (D)

34. (A)  (B)  (C)  (D) 
35. (A)  (B)  (C)  (D) 
36. (A)  (B)  (C)  (D) 
37. (A)  (B)  (C)  (D) 
38. (A)  (B)  (C)  (D) 
39. (A)  (B)  (C)  (D) 
40. (A)  (B)  (C)  (D) 

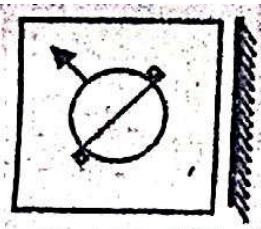
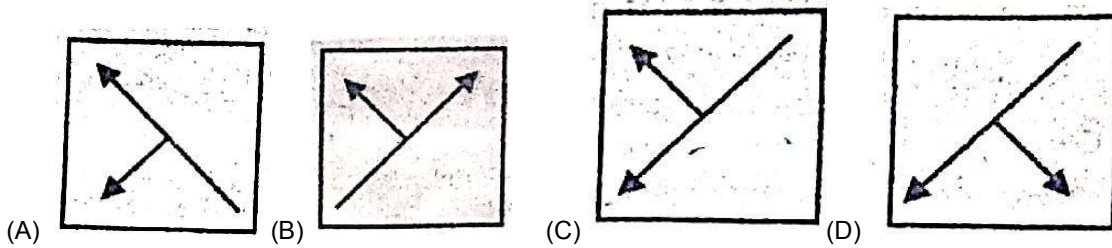
Instruction : Find out the correct mirror image of the image in question no. 41 to 45.



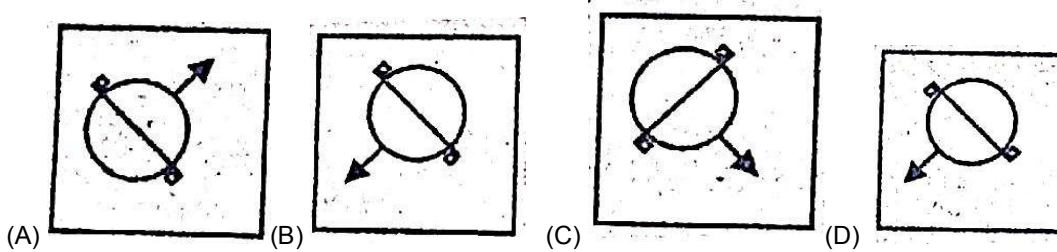
41.



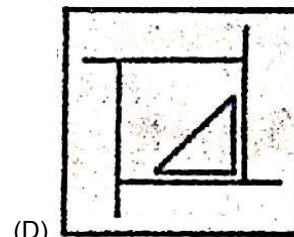
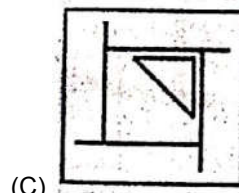
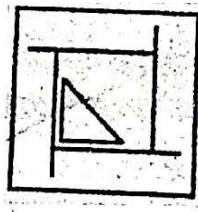
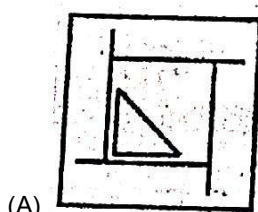
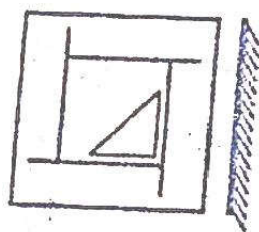
42.



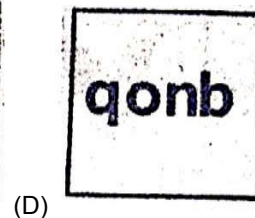
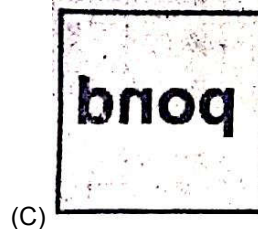
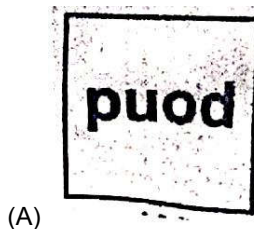
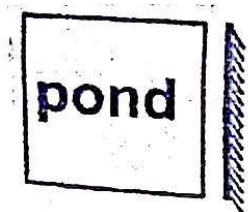
43.



44.

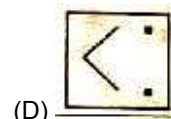
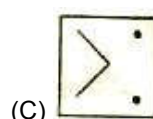
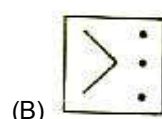
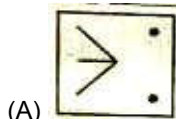
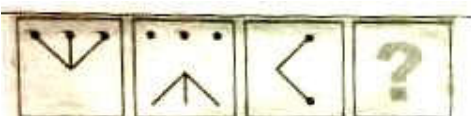


45.

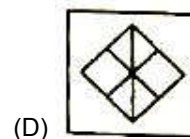
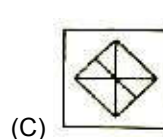
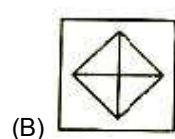
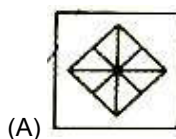
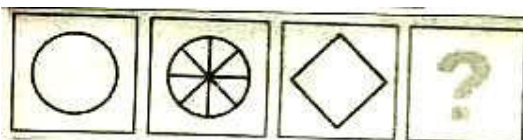


Instruction : Find out the correct correlation and answer the question 46 to 47.

46.



47.



48. Delhi : Haryana, Orissa : ?
 (A) Jammu & Kashmir (B) Andhra Pradesh (C) Tamil Nadu (D) Nagaland
49. Horse : Grass, Vehicles ?
 (A) Smoke (B) Petrol (C) Lubricating Oil (D) Crude Oil
50. Boat : Unship, Balloon :
 (A) Rubber (B) Nylon (C) Rope (D) Hot Air

Instruction: Answer question no. 51 to 60 as shown in example and find out the correct code from the given options by converting the given words in a symbolic language.

51. If FACB = GBDF then BADE = ?
 (A) CEEF (B) CEBF (C) CFBE (D) CBFE

Sol.

B	A	D	E
2	1	4	5
+1	+1	+1	+1
3	2	5	6
C	B	E	F

52. If RESULT = 798206 then LET = ?
 (A) 096 (B) 680 (C) 092 (D) 086

Sol. RESULT → 798206

Direct Relation with numbers

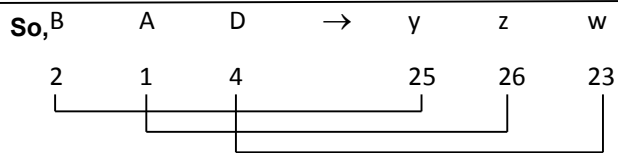
Let → 096

53. If ACE = ZXV then ? = YZW
 (A) BAD (B) ABD (C) EAC (D) SAD

Sol.

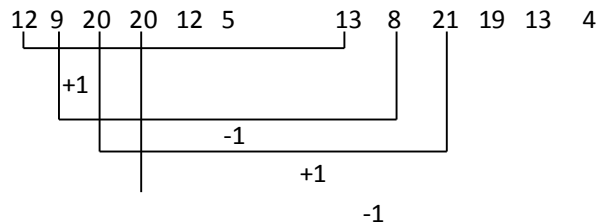
A	C	E	→	Z	X	V
1	3	5		26	24	22

SUM is 27.



54. If LITTLE = MHUSMD then ? = NTUD
 (A) MUTE (B) MOVE (C) MITE (D) MATE

Sol. L I T T L E → M H U S M D



So, M U T E → N T U D

+1 -1 +1 -1

55. If COUNTRY = EMWLVPA then ELECTORATE = ?
 (A) CJCEVQPYWC (B) GJQERQTYVG (C) CNCERQPCRG (D) GJGAVMTYVC

Sol. C O U N T R Y → E M W L V P A

+2 -2 +2 -2 +2 -2 +2

SO, E L E C T O R A T E → G J G A V M T Y V C

5 12 5 3 20 15 18 1 20 5 7 10 7 1 22 13 20 25 22 3

+2 -2 +2 -2 +2 -2 +2 -2 +2 -2

56. If PORTUGESE = ESEGUTROP then MALAYALAM = ?
 (A) MALAYALAM (B) MALAYALAM (C) MALAYALM (D) MALAYLAM

Sol. Option A and B are same

It is reverse order

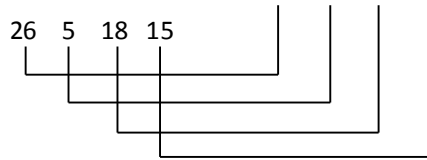
M A L A Y A L A M → M A L A Y A L A M



57. If MUSK = 146816 then ZERO = ?
 (A) 113811 (B) 122912 (C) 15915 (D) 2651815

Sol. M U S K → 14 6 8 16

So, Z E R O → 1 22 9 12



122912 Ans.

58. If MOTHERLAND = 9501623748 then DREAM. ?

(A) 82697

(B) 86297

(C) 82769

(D) 82679

Sol. MOTHERLAND → 9501623748

Direct relation with numbers

So, DREAM → 82679

59. If SCIENTIST = ICSTNETSI then AMBULANCE = ?

(A) MBUALNCEA

(B) BMAALUECN

(C) MAUBALCNE

(D) UBMLAECNA

Sol. Arrangement of first and last letter

60. If BOMBAY = GLRYFV then MADRAS . ?

(A) RXIOFP

(B) RIXOIP

(C) RXIOXP

(D) RXIOGQ

Sol. B O M B A Y → G L R Y F V

+5 -3 +5 -3 +5 -3

SIMILARLY

M A D R A S

13 1 4 18 1 19

+5 -3 +5 -3 +5 -3

18 24 9 15 6 16
R X I O F P

Instruction : Four options are given in question no. 61 to 70. One of the options is different from the rest of the three options. Find it out.

61. (A) Sodium

(B) Potassium

(C) Gallium

(D) Calcium Sulfate

62. (A) 1331

(B) 1728

(C) 4096

(D) 5832

Sol. $(11)^3 = 1331$ Cube of Prime No.

$(12)^3 = 1728$

$$(16)^3 = 4096$$

$$(18)^3 = 5832$$

63. (A) Table (B) Drum (C) Pakhavaj (D) Santoor

Sol. Except Santoor all are not string instruments.

64. (A) Mars (B) Mercury (C) Jupiter (D) Pluto

65. (A) Cone (B) Circle (C) Triangle (D) Rectangle

66. (A) Kite (B) Bird (C) Radar (D) Aeroplane

67. (A) Palm (B) Shoulder (C) Knee (D) Elbow

Sol. **Logic-1: all are joins except Palm**
Logic-2: all are upper body part except Knee

68. (A) Rabbit (B) Crocodile (C) Sluggish (D) Snails

69. (A) Short Vision (B) Spondylitis (C) Glaucoma (D) Conjunctivitis

Sol. Spondylitis is a condition of inflammation of the spine.

All other are Eye disease

70. (A) Amsterdam (B) Europe (C) Antarctica (D) Australia

Instruction : Find out the correct option by choosing logically appropriate sequence

71. 1. Gujarat 2. Earth 3. Somnath 4. universe 5. India
 (A) 32154 (B) 24135 (C) 15243 (D) 31524
72. 1. Mother 2. Child 3. Milk 4. Crying 5. Smile
 (A) 23145 (B) 12435 (C) 14135 (D) 15243
73. 1. Rainbow 2. Rain 3. Sun 4. Happy 5. Child
 (A) 42351 (B) 45123 (C) 21435 (D) 23154
74. 1. Table 2. Tree 3. Wood 4. Seed 5. Plant
 (A) 13245 (B) 45231 (C) 45321 (D) 12345
75. 1. Snake 2. Grasp 3. Eagle 4. Frog 5. Insect
 (A) 32145 (B) 52143 (C) 25413 (D) 24531

Instruction: Follow the instruction and choose the correct option. (Q.No.76 to 80)

76. If + means $\div$, $\div$ means $-$, $-$ means $\times$ and $\times$ means $\div$ then $10 \div 2 - 15 + 3 \times 5 = ?$
 (A) 10 (B) 15 (C) 25 (D) 5

Sol. $10 - 2 \times 15 \div 3 + 5 = 5$

77. If Δ means +, $\square$ means $-$, O means $\div$ and  means $\times$ then
-

(A) 26 (B) 14 (C) 37 (D) 55
Sol. $13 + 5 \times 20 \div 10 - 9 = 14$

78. If A means + , B means − , C means $\div$ and D means $\times$ then $10 \text{ D } 2 \text{ A } 5 \text{ B } 5 = ?$
 (A) 15 (B) 12 (C) 20 (D) 10

Sol. $10 \times 2 + 5 - 5 = 20$

79. If $P = 6, J = 4, L = 8, M = 24$ $M \times J \div L + J = ?$
 (A) 8 (B) 36 (C) 52 (D) 16

Sol. $24 \times 4 \div 8 + 4 = 16$

80. If Δ means $>$, $\square$ means $<$, O means $=$ and # and $A \text{ O } B$, $C \Delta D$ as well as $D \square A$, then which of the following is true?

(A) $C \# A$ (B) $B \Delta A$ (C) $B \square D$ (D) $A \square D$

Sol. $A = B$; $C > D$; $D < A$

$A = B > D$ and $C > D$

So, $B > D \Rightarrow B \Delta D$

Instruction : Follow the instruction and choose the correct option. (Q.No. 81 to 100)

81. If fourth Wednesday is on 25th of a month , what will be the date of Second Sunday of the same month?

(A) 8 (B) 14 (C) 12 (D) 10

Sol. 25th $\rightarrow$ Wednesday

So, 1st $\rightarrow$ Sunday

Second Sunday will be $= 1 + 7 = 8^{\text{th}}$

82. Today is Sunday , What day will be there after 112 days?
 (A) Friday (B) Sunday (C) Wednesday (D) Monday

Sol. No. of odd days $= \frac{112}{7} = 0$

So, Sunday it self

83. 15th August, 2019 was Thursday. What day will be there on 15th August, 2020 ?
 (A) Wednesday (B) Friday (C) Saturday (D) Thursday

15th Aug 2019 → Thursday
 15th Aug 2020 → ?

Sol.

366 odd days ($\because$ 2020 is a Leap Year)

$$\text{Odd days} = \frac{366}{7} = 2$$

So, Thursday +2 → Saturday

84. Which of the following is a Leap Year ?

- (A) 1900 (B) 2100 AD (C) 1990 AD (D) 2000 AD

85. A box has 4 white, 5 green and 6 Yellow ball in it. By how many ways can 3 balls be selected randomly from the box ?

- (A) 455 (B) 120 (C) 20 (D) 12

Sol. Total way to select = ${}^{15}C_3 = 455$

86. If 40 persons shake their hands with one another, what will be the total number of shaking hands ?

- (A) 820 (B) 780 (C) 80 (D) 512

Sol. Total Hand shakes = $39 + 38 + \dots + 3 + 2 + 1$

Sum of this AP = 780

87. Proportion ratio of the current age of A and B is 4 : 5. After 4 years, it will be 8 : 9. What will be the sum of the age of both A and B?

- (A) 18 years (B) 17 years (C) 9 years (D) 27 years

Sol. Let the current age be $4x$ and $5x$

$$\text{Now } \frac{4x+4}{5x+4} = \frac{8}{9}$$

$$\Rightarrow 36x + 36 = 40x + 32$$

$$\Rightarrow 4x = 4$$

$$\text{So, } x = 1$$

Current age = 4 year and 5 year

So, After 4 year = $(4+4) + (5+4) = 17$

88. Sum of the current age of Jay and Vijay is 40 years. After 7 years, the proportion ratio of their age will be 4 : 5. What will be the current age difference of both Jay and Vijay ?

- (A) 5 (B) 9 (C) 13 (D) 6

Sol. Let present age of Jay be x and Vijay y

$$x + y = 40 \quad \text{So, } y = 40 - x$$

$$\text{There after } \frac{x+7}{y+7} = \frac{4}{5} = \frac{x+7}{40-x+7}$$

$$\text{So, } x = 17 \quad \text{So, } y = 23$$

- 89.** Father's age is four times more plus 3 years than son's age. Mother's age is 4 years more Father's age is four times more plus 3 years than son's age. than father's age. If son's age is 5 years, what will be the age of mother ?

(A) 19 years (B) 23 years (C) 27 years (D) 21 years

Sol. Son Father Mother

$$x \quad 4x + 3 \quad 4x + 3 + 4$$

$$\text{If } x = 5$$

$$\text{So, Mother} = 4(5) + 3 + 4 = 27 \text{ Year}$$

- 90.** What is your relationship with your uncle's wife's one and only sister - in - law's daughter?

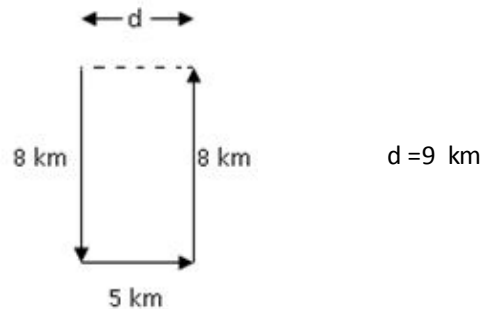
(A) Paternal Aunty (B) Maternal Aunty (C) Niece (D) Sister

Sol. Only sister in-law will be your mother

- 91.** Tanvi walks 8 km in the south from her house. Then she turns left and walks 5 km. Again, she turns left and walks 8 km. How far is she from her house ?

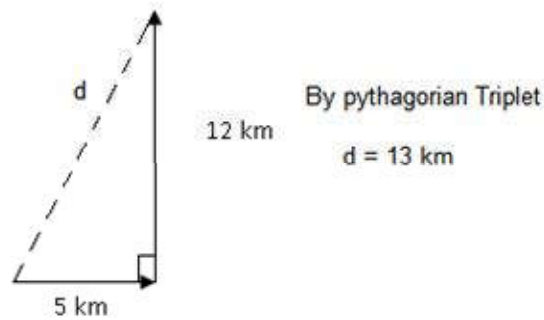
(A) 3 km (B) 8 km (C) 5 km (D) 13 km

Sol.



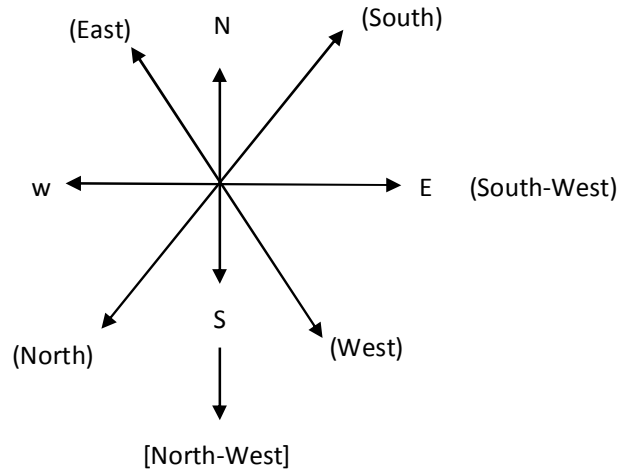
- 92.** Rehan walks 5 km in the east. Then, he turns perpendicularly left and walks 12 km. Now, at least how many kilometres will he have to walk to come back to the starting point ?

(A) 7 km (B) 17 km (C) 8.5 km (D) 13 km



93. If East = South West and South East = West, then South = ?
 (A) North West (B) North East (C) North (D) None of these

Sol.



94. 'A' the sister - in - law of 'B' and daughter - in - law of 'C'. 'D' is the father of 'E' and 'E' is the one and only brother of 'B'. Then, what is the relation of 'A' with 'E' ?
 (A) Sister-in-law (B) Wife (C) Mother (D) Aunty

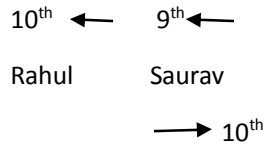
Sol.

$$C^- \leftrightarrow D^+ \\ \downarrow \\ A^- \leftrightarrow E^+ \rightarrow B$$

A is wife of E.

95. In a row, Saurav is at 10th position from the right side. If the same row, Rahul is at the 10th position from the right side. If both are beside each other, how many persons will be there in that row ?
 (A) 28 (B) 19 (C) 18 (D) None of these

Sol.



$$\begin{aligned}\text{Total No. of Student} &= \text{Rank from Left} + \text{Rank from Right} - 1 \\ &= 10 + 9 - 1 \\ &= 18\end{aligned}$$

- 96.** In a row of 37 students, Yogesh is at 17th position from the left side. Then, what will be his position from the right side ?

(A) 18 (B) 19th (C) 20th (D) 21st

Sol. $37 = 17 + x - 1$

$$x = 21^{\text{st}}$$

- 97.** In a row, Joseph, is at 15th position from the left side and at 13th position from the right side. How many boys will be there in that row ?

(A) 29 (B) 28 (C) 25 (D) 27

Sol. Total No. = $15 + 13 - 1 = 27$

- 98.** Basil is taller than Arbutus. Pomegranate is shorter than Hibiscus. Basil is taller than Pomegranate. If Arbutus is taller than Pomegranate, which will be the shortest plant ?

(A) Pomegranate (B) Basil (C) Hibiscus (D) Arbutus

Sol. $B > A$; $H > P$; $B > P$; $A > P$

$$\Rightarrow B > A > P$$

$$H > P$$

- 99 .** 'M' is bigger than 'P'. 'R' is smaller than 'K'. If 'K' is smaller than 'M', then, who is the biggest among all ?

(A) K (B) M (C) P (D) R

Sol. $M > P$; $K > R$; $M > K$

$$M > K > R$$

$$M > P$$

- 100.** The Rajdhani is longer than the Shatabdi. The Deccan is longer than the Memu. The Shatabdi is longer than the Memu. Which train has the least length ?

(A) Memu (B) Shatabdi (C) Rajdhani (D) Deccan

Sol. $R > S$; $D > M$; $S > M$

$$R > S > M$$
