

Date : 03/11/2019



Test Booklet Code
NE
MADHYA PRADESH

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Answers & Solutions

for

NTSE (Stage-I) 2019-20

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you open the question booklet.

1. Use blue/black ballpoint pen only. There is no negative marking.
2. Part I : MAT : 1 - 100 questions
Part II : SAT : 1 - 100 questions
3. This test booklet contains 200 questions of one mark each. All the questions are compulsory.
4. Answer each question by darkening the one correct alternative among the four choices on the OMR SHEET with blue/black ballpoint pen.

Example :

Q. No.	Alternatives
Correct way : 1	(A) (B) ● (D)
Q. No.	Alternatives
Wrong way : 1	(A) (B) (C) (D)

Student must darkening the right oval only after ensuring correct answer on OMR Sheet.

5. Students are not allowed to scratch / alter / change out an answer once marked on OMR Sheet, by using white fluid / eraser / blade / tearing / wearing or in any other form.
6. Separate sheet has been provided for rough work in this test booklet.
7. Please handover the OMR Sheet to the invigilator before leaving the Examination Hall.
8. Darken completely the ovals of your answer on OMR Sheet in the time limit allotted for that particular paper.
9. Your OMR Sheet will be evaluated through electronic scanning process. Incomplete and incorrect entries may render your OMR Sheet invalid.
10. Use of electronic gadgets, calculator, mobile etc, is strictly prohibited.

11. If 'ROHIT' is coded as 'SPIJU', how will 'MOHIT' be coded?
 (A) NPIJU (B) LNGHS
 (C) ZATIU (D) None of the above

Answer (A)

Sol. R $\xrightarrow{+1}$ S Mohit \rightarrow NPIJU
 O $\xrightarrow{+1}$ P
 H $\xrightarrow{+1}$ I
 I $\xrightarrow{+1}$ J
 T $\xrightarrow{+1}$ U

12. If 'MEAT' is coded as '135120', how will 'TIME' be coded?
 (A) 209135 (B) 211395
 (C) 26245 (D) None of the above

Answer (A)

Sol. M \rightarrow 13 T \rightarrow 20
 E \rightarrow 5 I \rightarrow 9
 A \rightarrow 1 M \rightarrow 13
 T \rightarrow 20 E \rightarrow 5

13. In a certain code, 'ROAD' is written as 'URDG'. How is 'SWAN' written in that code?
 (A) VXDQ (B) VZDQ
 (C) VZCP (D) UXDQ

Answer (B)

Sol. R $\xrightarrow{+3}$ U S $\xrightarrow{+3}$ V
 O $\xrightarrow{+3}$ R W $\xrightarrow{+3}$ Z
 A $\xrightarrow{+3}$ D A $\xrightarrow{+3}$ D
 D $\xrightarrow{+3}$ G N $\xrightarrow{+3}$ Q

14. If each letter in the English alphabet is assigned odd Numerical value beginning A = 1, B = 3, C = 5 and so on. What will be the value of the letters of word INDIAN?
 (A) 86 (B) 88
 (C) 89 (D) 96

Answer (D)

Sol. INDIAN = 96

15. In a certain language 'LUTE' is written as 'MUTE' and 'FATE' is written as 'GATE', then how will 'BLUE' be written?
 (A) CLUE (B) GLUE
 (C) FLUE (D) SLUE

Answer (A)

Sol. L $\xrightarrow{+1}$ M B $\xrightarrow{+1}$ C
 U \rightarrow U L \rightarrow L
 T \rightarrow T U \rightarrow U
 E \rightarrow E E \rightarrow E

Directions (Q.16 to Q.20) : Of the four alternatives, find the odd one out.

16. (A) Fast – Slow (B) Bright – Dark
 (C) Day – Night (D) Valley - Depth

Answer (D)

17. (A) Zebra (B) Lion
 (C) Tiger (D) Horse

Answer (D)

18. (A) January (B) May
 (C) November (D) July

Answer (C)

Sol. November (It has 30 days)

19. (A) Radish (B) Carrot
 (C) Spinach (D) Potatoes

Answer (C)

20. (A) 333 (B) 153
 (C) 783 (D) 213

Answer (D)

Sol. 213 (All divisible by 9 Except 213)

21. If 'cook' is called 'butler', 'butler' is 'manager', 'manager' is 'teacher', 'teacher' is 'clerk' & 'clerk' is 'principal', who will teach in a class?
 (A) Clerk (B) Cook
 (C) Butler (D) Manager

Answer (A)

22. If 'Black' means 'Pink', 'Pink' means 'Blue', 'Blue' means 'White', 'White' means 'Yellow', then what is the colour of clear sky?
 (A) Brown (B) Pink
 (C) Red (D) Blue

Answer (B)

Sol. Answer will be white, but not given in options either (B) OR no option.

Directions (Q.23 to Q.35) : One of the four Alternatives given under the each question satisfies the same relation as is found between two patterns to the left of the sign :: given in the question. Find the correct alternative.

23. Virat Kohli : Cricket :: Mary Kom : ?

- (A) Boxing (B) Badminton
(C) Cricket (D) Tennis

Answer (A)

24. 81 : 3 :: 16 : ?

- (A) 2 (B) 4
(C) 9 (D) 12

Answer (A)

25. Aeroplane : Hanger :: Car : ?

- (A) Port (B) Garage
(C) Depot (D) Harbour

Answer (B)

26. Bees : Swarm :: Cattle : ?

- (A) Mob (B) Flock
(C) Herd (D) Shoal

Answer (C)

27. Rupee : India :: Yen : ?

- (A) Turkey (B) Bangladesh
(C) Japan (D) Pakistan

Answer (C)

28. Air : Atmosphere :: Water : ?

- (A) Hydrosphere (B) Ecosphere
(C) Biosphere (D) Stratosphere

Answer (A)

29. Mumbai : Maharashtra :: Raipur : ?

- (A) Gujarat (B) Kerala
(C) Chhattisgarh (D) Jharkhand

Answer (C)

30. Ship : Sea :: Camel : ?

- (A) Forest (B) Mountain
(C) Land (D) Desert

Answer (D)

31. Thermometer : Temperature :: Barometer : ?

- (A) Pressure (B) Humidity
(C) Electric current (D) Earthquake intensity

Answer (A)

32. Dog : Rabies :: Mosquito : ?

- (A) Sting (B) Malaria
(C) Death (D) Plague

Answer (B)

33. Tuberculosis : Lungs :: Cataract : ?

- (A) Ear (B) Throat
(C) Eyes (D) Skin

Answer (C)

34. AB : ZY :: CD : ?

- (A) XW (B) WV
(C) XY (D) WX

Answer (A)

Sol. XW (Corresponding letter from last)

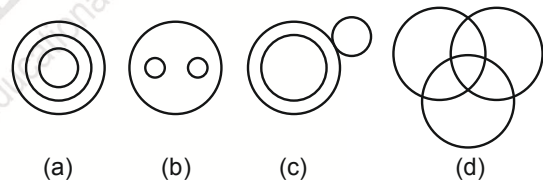
35. Cruel : Kind :: Lazy : ?

- (A) Alert (B) Sharp
(C) Interest (D) Shrewd

Answer (A)

Sol. Alert (opposite)

Directions (Q.36 to Q.39) : Four types of figures (a), (b), (c) & (d) are given. One of the figure type represents the relation of 3 types of things. Select the right answer.



36. Bus; Car; Vehicle

- (A) a (B) b
(C) c (D) d

Answer (B)

37. Week, Day, Year

- (A) a (B) b
(C) c (D) d

Answer (A)

38. Thief, Criminal, Judge

- (A) a (B) b
(C) c (D) d

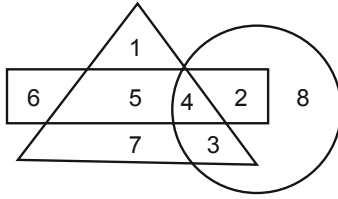
Answer (C)

39. Professor, Researcher, Scientist

- (A) a (B) b
(C) c (D) d

Answer (D)

40. Which number is in all Geometrical figures?



- (A) 3 (B) 4
(C) 5 (D) 8

Answer (B)

41. Rohit travels 7 km to the North. He then turns right and walks 4 km. He again turns right and moves 4 km forward. How many km is he from the starting point?

- (A) 6 km (B) 5 km
(C) 9 km (D) 15 km

Answer (B)

42. Pointing to a man, a woman said, "He is the son of only son of my grandfather". How is that man related to woman?

- (A) Uncle (B) Brother
(C) Cousin (D) None of these

Answer (B)

43. What is the product of all the Numbers in the Dial of a Telephone?

- (A) 158480 (B) 0
(C) 159450 (D) 159480

Answer (B)

44. If '÷' means '×', '×' means '+', '+' means '-' and '-' means '÷' find the value of $16 \times 3 + 5 - 2 \div 4$.

- (A) 9 (B) 10
(C) 19 (D) None of these

Answer (A)

Sol. $16 \times 3 + 5 - 2 \div 4$

$$16 + 3 - 5 \div 2 \times 4 = 9$$

45. If '<' means '-', '>' means '+' and '\$' means '÷', then what would be the value of $27 > 81 \$ 9 < 6$?

- (A) 6 (B) 33
(C) 36 (D) 30

Answer (D)

Sol. $24 > 81 \$ 9 < 9$

$$27 + 81 \div 9 - 9 = 30$$

46. If the seven (7th) day of the month is Tuesday, what day will it be on the 19th day of the month?

- (A) Sunday (B) Monday
(C) Wednesday (D) Friday

Answer (A)

47. Rohan ranks 7th from the top and 26th from the bottom in a class. How many students are there in the class?

- (A) 31 (B) 32
(C) 33 (D) 34

Answer (B)

48. In the following Number series, how many alphabets are written twice, consecutively?

G O S S R G M L G T O P Q Q R P P S O G

- (A) 3 (B) 5
(C) 1 (D) 2

Answer (A)

49. You go North, turn right, then turn right again and then go to the left. In which direction you are now?

- (A) North (B) South
(C) East (D) West

Answer (C)

50. In the following words. Which word will come third in the English dictionary?

- (A) Fallible (B) Faithfully
(C) False (D) Follow

Answer (C)

51. Which of the following words will come third in English dictionary?

- (A) Magnify (B) Magnetic
(C) Magical (D) Martial

Answer (A)

Sol. I → Magical

II → Magnetic

III → Magnify

IV → Martial

52. $66 \times 83 = 8636$

$$56 \times 73 = 7635$$

$$46 \times 63 = 6634$$

$$36 \times 53 = ?$$

- (A) 5633 (B) 5643
(C) 5655 (D) 5663

Answer (A)

Sol.

$$\begin{array}{l} \overbrace{66 \times 83} = 8636 \\ \overbrace{56 \times 73} = 7635 \\ \overbrace{46 \times 63} = 6634 \\ \overbrace{36 \times 53} = 5633 \end{array}$$

53. If $9 - 3 - 1 = 913$, $6 - 5 - 4 = 645$, then $8 - 7 - 0 = ?$
- (A) 708 (B) 780
(C) 807 (D) 804

Answer (C)

Sol.

$$\begin{array}{l} \overbrace{9 - 3 - 1} = 913 \\ \overbrace{6 - 5 - 4} = 645 \\ \overbrace{8 - 7 - 0} = 807 \end{array}$$

54. On subtracting 9 from this number its digits are reversed. Point out the number.
- (A) 36 (B) 45
(C) 54 (D) 27

Answer (C)

Sol. Let number is $10x + y$

$$\begin{aligned} 10x + y - 9 &= 10y + x \\ 9x - 9y &= 9 \\ x - y &= 1 \end{aligned}$$

So, number is 54 Answer.

55. How many 4's are there in the series below which are preceded by 8 and followed by 0
- 8404804804804804804804804804
- (A) 2 (B) 3
(C) 4 (D) 5

Answer (B)

Sol. 8 4 0 4 8 0 4 8 0 4 8 0 8 4 0 8 0 4 8 0 4

8 4 0 8 0 4

Soans will be (3 pair)

56. An athlete runs 10 km in 30 min. Then his speed in km/h is
- (A) 25 km/h (B) 20 km/h
(C) 30 km/h (D) 10 km/h

Answer (B)

Sol. Speed = $\frac{\text{Distance}}{\text{Time}}$

$$\left(\frac{10}{30}\right) \times 60$$

= 20 km/h

57. A and B together can do a piece of work in 6 days. A alone can do it in 9 days. In how many days can B alone do it?
- (A) 18 (B) 14
(C) 16 (D) 20

Answer (A)

Sol. Let A can do work alone in x days and B can do work alone in Y days

$$\text{So, } \frac{1}{x} + \frac{1}{y} = \frac{1}{6}$$

Now $x = 9$

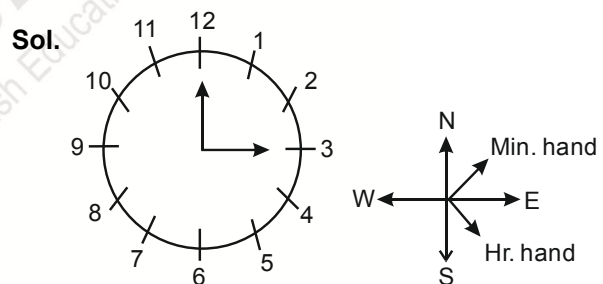
$$\frac{1}{9} + \frac{1}{y} = \frac{1}{6}$$

$$\frac{1}{y} = \frac{1}{6} - \frac{1}{9} = \frac{1}{18}$$

$y = 18$ Days.

58. It's 3 'O'clock in a wrist watch. If the minute hand points towards North-East direction, then the hour hand will point towards which direction?
- (A) South-West (B) North-West
(C) South (D) South-East

Answer (D)



So and will be (South-East)

Directions (Q.59 to Q.62) : In a certain code 'ca na da' means 'how are you' 'ta na co' means 'we are happy'; 'ta po da' means 'we and you'

59. What is the code for 'happy'?
- (A) ca (B) co
(C) po (D) na

Answer (B)

60. What is the code for 'how'?
- (A) ca (B) ta
(C) po (D) co

Answer (A)

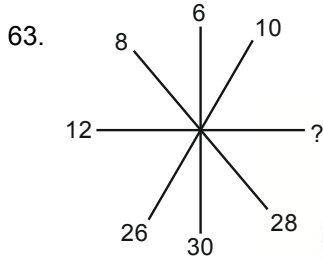
61. What is the code for 'you are happy'?
- (A) ca co na (B) ta an co
(C) po ca da (D) da na co

Answer (D)

62. 'how you happy' will be coded as?
- (A) po ca da (B) ca da co
(C) na da na (D) co ca po

Answer (B)

Directions (Q.63 & Q.64) : Find the missing numerical value in following questions.

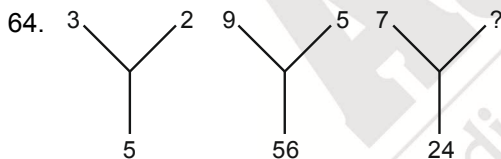


- (A) 26 (B) 25
(C) 24 (D) 38

Answer (C)

Sol. Sum of pair-wise number is 36

$$\begin{aligned} 6 + 30 &= 36 \\ 8 + 28 &= 36 \\ 26 + 10 &= 36 \\ 12 + x &= 36 \\ 36 - 12 &= x \\ x &= 24 \end{aligned}$$



- (A) 5 (B) 4
(C) 3 (D) 2

Answer (A)

Sol. $(3)^2 - (2)^2 = 5$
 $(9)^2 - (5)^2 = 56$
 $(7)^2 - (x)^2 = 24$
 $x^2 = 25$
 $x = 5$

65. Arrange the following events in the order as they occur to form meaningful sequence

1. Consultation, 2. Illness,
3. Treatment, 4. Recovery

- (A) 2, 1, 3, 4 (B) 3, 2, 1, 4
(C) 1, 2, 3, 4 (D) 3, 1, 2, 4

Answer (A)

- Sol.** 1. Consultation
2. Illness
3. Treatment
4. Recovery

Illness – Consultation – Treatment – Recovery

1 2 3 4

66. In a certain code 'FISH' is written 'EHRG', how will 'JUNGLE' be written in that code?

- (A) ITNFKD (B) ITMFKD
(C) IKMFKD (D) TIMFKD

Answer (B)

Sol. F I S H

$$-1 | -1 | -1 | -1 |$$

E H R G

J U N G L E

$$-1 | -1 | -1 | -1 | -1 | -1 |$$

ITMFKD

67. If 'A' denotes '+', 'B' denotes '÷', 'C' denotes '-', 'D' denotes 'x', then

$$5 A 1 4 B 2 D 2 C 2 = ?$$

- (A) 20 (B) 17
(C) 19 (D) 16

Answer (B)

Sol. $5 A 1 4 B 2 D 2 C 2 = ?$

$$5 + 14 \div 2 \times 2 - 2$$

$$5 + 7 \times 2 - 2$$

$$5 + 14 - 2$$

$$= 17$$

68. If $9^*4 = 169$, then what is the value of 14^*1 ?

- (A) 144 (B) 169
(C) 125 (D) 225

Answer (D)

Sol. $9^*4 = 19$

$$(9 + 4)^2 = 169$$

So, 14^*1

$$(14 + 1)^2 = (15)^2 = 225$$

69. Divide ₹ 640 among A, B & C so that A have 30%, B have 45% and C have the rest. How much the C have?

- (A) 160 (B) 232
(C) 212 (D) 200

Answer (A)

Sol. A will get 30% of 640 = ₹192

B will get 45% of 640 = ₹288

So, C will get amount = 640 – (192 + 288)

₹160

70. 'A' is 3 years older than 'B' and 3 years younger to 'C' while 'B' and 'D' are twins. How many years is C older than D?

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

Answer (A)

Sol. Let age of B = x year

So, age of A = (x + 3)

Age of c = (x + 6)

Age of D = x year

So, difference in age of C and D = 6 years

Directions (Q.71 & Q.72) : Arrange the given words as they occur in the dictionary.

71. 1. Inward, 2. Ion, 3. Iodine, 4. Invite, 5. Iodoform

- (A) 4, 1, 2, 5, 3 (B) 4, 1, 3, 5, 2
(C) 1, 3, 2, 4, 5 (D) 5, 4, 1, 2, 3

Answer (B)

Sol. 1. Inward

2. Ion

3. Iodine

4. Invite

5. Iodoform

Invite – Inward – Iodine – Iodoform – Ion

4 1 3 5 2

72. 1. Matter, 2. Meal, 3. Maze, 4. Maximum, 5. Mean

- (A) 2, 3, 5, 4, 1 (B) 1, 4, 2, 5, 3
(C) 1, 4, 3, 2, 5 (D) 4, 1, 3, 2, 5

Answer (C)

Sol. 1. Matter

2. Meal

3. Maze

4. Maximum

5. Mean

Matter – maximum – maze – meal – mean

1 4 3 2 5

73. In the digits of number 6492758 are written in ascending order, then how many digits will remain unchanged?

- (A) One (B) Two
(C) None (D) Three

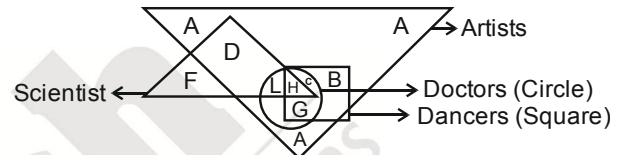
Answer (B)

Sol. 6 4 9 2 7 5 8

↑ ↓

2 4 5 6 7 8 9

Directions (Q.74 to Q.78) : Study the figure and answer the question given below :



74. Which letter represents the artists who are doctors and dancers only?

- (A) A (B) D
(C) G (D) H

Answer (C)

75. Which letter represents the Artists who are neither scientists nor doctors?

- (A) A and B (B) A and L
(C) B and G (D) L and H

Answer (A)

76. Which letter represents the Artists who are dancers as well as doctors only?

- (A) A and D (B) C and G
(C) C and D (D) G and H

Answer (B)

77. Which letter represents the Artists who are neither doctors nor scientists nor dancers?

- (A) A (B) D
(C) F (D) G

Answer (A)

78. Which letter represents the scientists only?

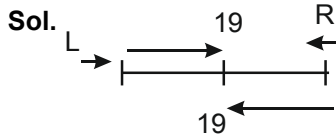
- (A) B (B) D
(C) F (D) L

Answer (C)

79. A class of boys stands in a single line. One boy is nineteenth in order from both the ends. How many boys are there in the class?

- (A) 27 (B) 37
(C) 38 (D) 39

Answer (B)



$$19 + 19 = 38 - 1 = 37$$

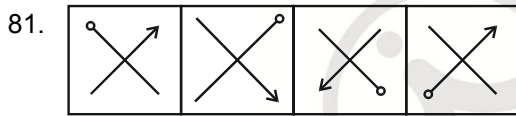
80. In the following series, how many pairs of successive numbers have difference of 2 each?

6 4 1 2 2 8 7 4 2 1 5 3 8 6 2 1 7 1 4 1

- (A) Four (B) Five
(C) Six (D) Seven

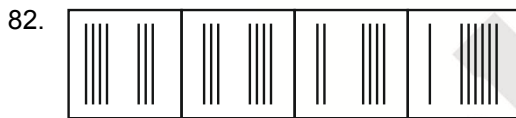
Answer (A)

Directions (Q.81 to Q.90) : Choose the odd figure out of the given.



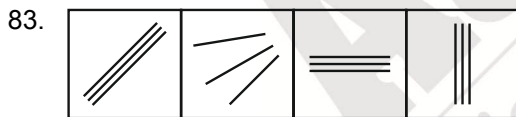
- (A) A (B) B
(C) C (D) D

Answer (D)



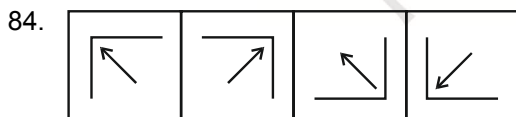
- (A) A (B) B
(C) C (D) D

Answer (C)



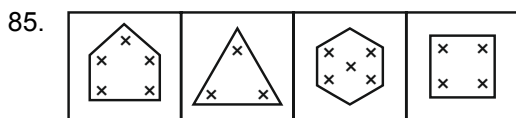
- (A) A (B) B
(C) C (D) D

Answer (B)



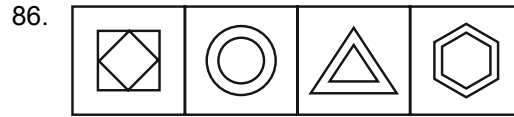
- (A) A (B) B
(C) C (D) D

Answer (C)



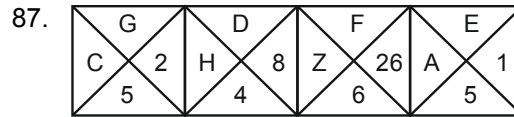
- (A) A (B) B
(C) C (D) D

Answer (C)



- (A) A (B) B
(C) C (D) D

Answer (A)



- (A) A (B) B
(C) C (D) D

Answer (A)



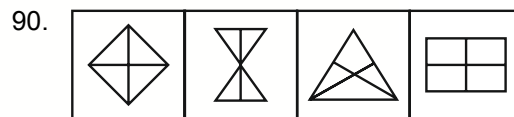
- (A) A (B) B
(C) C (D) D

Answer (D)



- (A) A (B) B
(C) C (D) D

Answer (D)



- (A) A (B) B
(C) C (D) D

Answer (C)

Directions (Q.91 to Q.95) : Study the following information and answer the given questions :

- B and E are good in Dramatics and Computer Science.
- A and B are good in Computer Science and Physics.
- A, D and C are good in Physics and History.
- C and A are good in Physics and Mathematics.
- D and E are good in History and Dramatics.

Solutions for Q.91 to Q.95 :

Dramatic	Computer Science	Physics	Maths	History
B	B	A	A	A
E	E	B	C	D
D	A	D		C
		C		E

91. Who is good in Physics, History and Dramatics?

- (A) A (B) B
(C) D (D) E

Answer (C)

92. Who is good in Physics, History and Mathematics, but not in computer Science?

- (A) A (B) B
(C) C (D) D

Answer (C)

93. Who is good in Computer Science, History and Dramatics?

- (A) A (B) B
(C) C (D) E

Answer (D)

94. Who is good in History, Physics, Computer Science and Mathematics?

- (A) A (B) B
(C) C (D) D

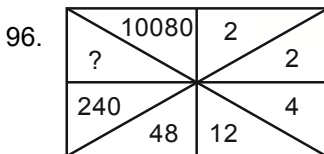
Answer (A)

95. Who is good in Physics, Dramatics and Computer Science?

- (A) A (B) B
(C) D (D) E

Answer (B)

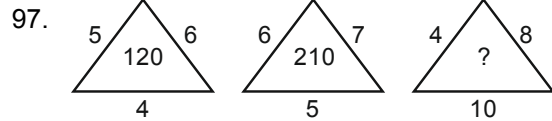
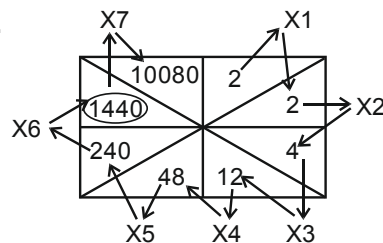
Directions (Q.96 to Q.98) : Find the missing number from among the given alternatives :



- (A) 1440 (B) 2880
(C) 860 (D) 1140

Answer (A)

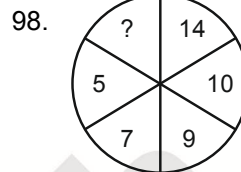
Sol.



- (A) 310 (B) 320
(C) 330 (D) 300

Answer (B)

Sol. $6 \times 5 \times 4 = 120$
 $6 \times 5 \times 7 = 210$
 $4 \times 10 \times 8 = 320$



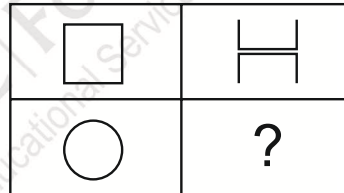
- (A) 3 (B) 6
(C) 18 (D) 2

Answer (C)

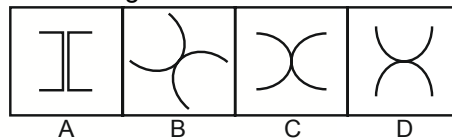
Sol. $5 \times 2 = 10$
 $7 \times 2 = 14$
 $9 \times 2 = 18$

Directions (Q.99 & Q.100) : In each of the following questions; find out which of the answer figure complete the matrix.

99. Question Figure



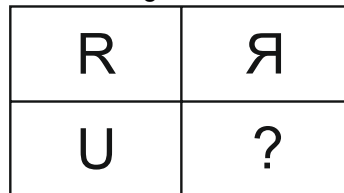
Answer Figure



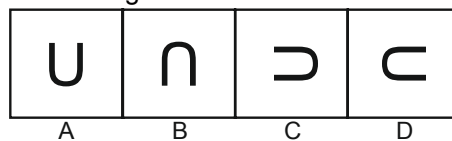
- (A) A (B) B
(C) C (D) D

Answer (D)

100. Question Figure



Answer Figure



- (A) A (B) B
(C) C (D) D

Answer (A)

PART-II : SCHOLASTIC APTITUDE TEST (SAT)

1. The value of acceleration due to gravity is :

- (A) Least on equator
 (B) Least on poles
 (C) Same on equator & pole
 (D) Increases from pole to equator

Answer (A)

$$\text{Sol. } g = \frac{GM}{R^2}$$

$$R_e > R_p$$

$$\text{So, } g_e < g_p$$

2. The numerical ratio of displacement to distance covered by a moving object is :

- (A) Always < 1 (B) Always = 1
 (C) Always > 1 (D) = or < 1

Answer (D)

Sol. Distance \geq Displacement

$$1 \geq \frac{\text{Displacement}}{\text{Distance}}$$

3. According to third law of motion, action and reaction:

- (A) Always act on the same body
 (B) Always act on different bodies in opposite direction
 (C) Have same magnitude and direction
 (D) Act on any one of the body at normal to each other

Answer (B)

Sol. According to definition of law.

4. The S.I. unit of retardation is

- (A) ms^{-1} (B) ms^{-2}
 (C) ms^2 (D) m

Answer (B)

$$\text{Sol. Unit} = \frac{\text{Unit of velocity}}{\text{Unit of time}} = \frac{\text{m/s}}{\text{s}} = \text{m/s}^2$$

5. _____ is located behind a convex mirror :

- (A) The focal point (B) A ray
 (C) A real image (D) The object

Answer (A)

6. When white light passes through the prism colour which deviates the least is :

- (A) Red (B) Blue
 (C) Violet (D) Green

Answer (A)

$$\text{Sol. } \mu \propto \frac{1}{\lambda} \text{ and } \delta \propto \mu$$

7. Two charged bodies having equal potential are connected through a conducting wire. In this case

- (A) Current will flow
 (B) Not flow
 (C) Can't say
 (D) Current will flow if a resistance is connected

Answer (B)

Sol. Current flows due to potential difference.

8. Two parallel wires carrying current in opposite directions

- (A) Attract each other
 (B) Repel each other
 (C) Do not affect each other
 (D) Get moved to perpendicular to each other

Answer (B)

Sol. Property of magnetic force.

9. The magnetic field inside a solenoid is :

- (A) Non-uniform
 (B) Variable
 (C) Same at all points except at its ends
 (D) Zero

Answer (C)

Sol. $B = \mu_0 n I$ except ends.

10. Inside a magnet lines of force move from :

- (A) North to south pole
 (B) Away from north pole
 (C) South to north pole
 (D) Away from south pole

Answer (C)

Sol. Property of field lines inside magnet.

11. The resistance of a conductor is directly proportional to :
- (A) Its area of cross-section
(B) Density
(C) Melting point
(D) Length

Answer (D)

Sol. $R = \rho \frac{l}{A}$

12. Light travels fastest in which of the following materials
- (A) Diamond (B) Water
(C) Glass (D) Air

Answer (D)

Sol. Since refractive index of air = 1

13. Acceleration always acts in the direction :
- (A) Of displacement (B) Of the initial velocity
(C) Of net force (D) Of final velocity

Answer (C)

Sol. $\vec{F} = m\vec{a}$ and mass is always positive.

14. Which statements are correct regarding the following reaction?
- $$2\text{PbO}(s) + \text{C}(s) \rightarrow 2\text{Pb}(s) + \text{CO}_2(g)$$
- (1) Lead is reduced
(2) Carbon dioxide is oxidised
(3) Carbon is oxidised
(4) Lead oxide is reduced
- (A) (1) and (2) (B) (3) and (4)
(C) (1), (2) and (3) (D) All

Answer (B)

Sol. PbO is reduced and carbon is oxidised

15. What will happen on putting dilute HCl on iron powder?
- (A) Hydrogen gas and FeCl₂ will form
(B) Chlorine gas and FeCl₂ will form
(C) FeCl₂ and H₂O will form
(D) Will be no reaction

Answer (A)

Sol. $\text{Fe} + \text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2(g)$

Hydrogen gas and FeCl₂ will form

16. The number of covalent bonds in ethane are :
- (A) 6 (B) 7
(C) 8 (D) 9

Answer (B)

Sol. C₂H₆

There are 7 covalent bonds in ethane

17. If electronic configuration of an atom is 2, 8, 7, then atomic number of atom will be :
- (A) 15 (B) 16
(C) 17 (D) 18

Answer (C)

Sol. K L M

$$2, 8, 7 = 17$$

Atomic number Cl = 17

18. Which functional group is present in Butanone?



Answer (C)

Sol. Butanone ketone functional group is present

19. Which will have electronic configuration 2, 8, 2?
- (A) Na (B) Mg
(C) Al (D) Si

Answer (B)

Sol. $\text{Mg} = \frac{\text{K,L,M}}{2,8,2}$ atomic number of Mg is 12

20. Which element have two shells and both these shells are fulfilled with electrons?
- (A) S (B) Ne
(C) N (D) He

Answer (B)

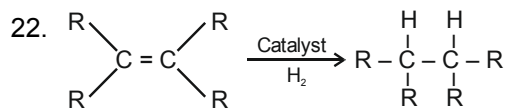
Sol. $_{10}\text{Ne} = 2, 8$

Both K and L shells are completely filled

21. $\text{CH}_4 + \text{Cl}_2 \xrightarrow{\text{sunlight}} \text{CH}_3\text{Cl} + \text{HCl}$. This reaction is
- (A) Substitution (B) Oxidation
(C) Combination (D) Reduction

Answer (A)

Sol. It is a type of substitute reaction hydrogen is being substituted by Cl.



The given reaction is

- (A) Oxidation (B) Reduction
(C) Substitution (D) Decomposition

Answer (B)

Sol. Addition of hydrogen is known as Reduction.

23. The structural formula of cyclopentane is :



Answer (C)

Sol. Cyclopentane.

24. The name of $\text{H} - \overset{\text{O}}{\parallel}{\text{C}} - \text{H}$ is

- (A) Acetone (B) Acetic Acid
(C) Ethanol (D) Formaldehyde

Answer (D)

Sol. Formaldehyde (functional group is Aldehyde)

25. Which among the following is/are saturated compound?

- (A) CH_4 (B) C_3H_8
(C) C_5H_{12} (D) All the above

Answer (D)

Sol. All are saturated hydrocarbon (Alkane)

26. XCl_2 is a solid and high melting point compound. X will be

- (A) Na (B) Mg
(C) Al (D) Si

Answer (B)

Sol. In XCl_2 valency of X is 2

Mg = 2, 8, 2

27. Which of the following is not a divisional stage?

- (A) Telophase (B) Prophase
(C) Metaphase (D) Interphase

Answer (D)

Sol. Interphase is the resting stage during cell division. The cell prepares itself for division during interphase.

It divides during M-Phase, which can be divided into prophase, metaphase, anaphase and telophase.

28. Cell Organelles are embedded in

- (A) Cytoplasmic membrane
(B) Mucin
(C) Protoplasm
(D) Cytoplasm

Answer (D)

Sol. Cytoplasm refers to fluid that fills the cell, it includes cytosol and cell organelles.

29. Growth rings are formed by the activity of

- (A) Xylem
(B) Phloem
(C) Both Xylem and Phloem
(D) Cambium

Answer (D)

Sol. Due to differential seasonal activity of cambium, autumn wood and spring wood are formed. Autumn wood & spring wood of a year collectively constitute annual (growth) rings.

30. Reserve Food Product of most of the algae is

- (A) Glycogen (B) Fat
(C) Cellulose (D) Starch

Answer (D)

Sol. Reserve food in algae is starch (Plant storage carbohydrate). Different types of starch are found in different algae.

31. Largest Ecosystem of the world are

- (A) Forest (B) Grassland
(C) Great lakes (D) Oceans

Answer (D)

Sol. Oceans are world's largest ecosystem.

32. The Xylem in plants are responsible for

- (A) Transport of water
(B) Transport of oxygen
(C) Transport of food
(D) Transport of Amino acid

Answer (A)

Sol. Xylem is responsible for conduction of water and minerals in plants.

33. Budding type of Reproduction is found in

- (A) Peepal (B) Bryophyllum
(C) Rose (D) Sugarcane

Answer (B)

Sol. In Bryophyllum, adventitious buds are developed in margins of the leaves. When the leaf falls on moist soil, these buds develop into plantlets, which then separates into individual plants.

34. Which of the following acid is also a vitamin?

- (A) Ascorbic acid (B) Formic acid
(C) Malic acid (D) Palmitic acid

Answer (A)

Sol. Chemically, vitamin C is ascorbic acid.

35. Which of the following plant tip has Quiescent centre?

- (A) Stem (B) Root
(C) Leaf (D) Sepal

Answer (B)

Sol. Quiescent centre is a very small group of non-dividing living cells, found between root cap and meristem. It has low DNA, RNA & proteins. It provides new cells to meristem in case of damage only.

36. Which of the following is a plant Hormone?

- (A) Insulin (B) Thyroxin
(C) Cytokinin (D) Oestrogen

Answer (C)

Sol. Cytokinin is a plant hormone responsible for cell division (predominantly) in plants.

37. Ribosomes are granules formed of

- (A) Only m-RNA (B) Only Proteins
(C) r RNA + Proteins (D) Only DNA

Answer (C)

Sol. Ribosomes are made up of r-RNA and ribosomal proteins.

38. The Anther contains

- (A) Sepals (B) Ovules
(C) Pistil (D) Pollen-grains

Answer (D)

Sol. Anther produces pollen grains.

39. Cell Organelles essential for photorespiration is

- (A) Ribosome (B) Dictyosomes
(C) Peroxisomes (D) Glyoxisome

Answer (C)

Sol. Photorespiration occurs in chloroplasts, peroxisomes and mitochondria in order of their participation.

40. Pollination in Maize held by

- (A) Insect (B) Water
(C) Air (D) Animal

Answer (C)

Sol. Maize is a wind/air pollinated plant.

41. Which of the following cities in not related to the Indus civilization?

- (A) Mohenjo daro (B) Kalibangan
(C) Lothal (D) Patliputra

Answer (D)

Sol. Fact

42. Which was the governor General during the 1857 the first war of independence?

- (A) Lord Dalhousie (B) Lord Ripon
(C) Lord Curzon (D) Lord Canning

Answer (D)

Sol. Fact

43. Who was the founder of Satya Shodhak Samaj?

- (A) Ram Mohan Roy (B) Dayanand Saraswati
(C) Jyotiba Phule (D) Swami Vivekanand

Answer (C)

Sol. Fact

44. Which of the following foreign travellers came to India during Chandra Gupta Maurya's Period?

- (A) Fa-Xian (B) Arena
(C) XuanZang/Hiuen Tsang (D) Megasthenes

Answer (D)

Sol. Fact

45. Who among the following is called the "Bhoja of Andhra"?

- (A) Krishnadeva Rai (B) Veer Narsimha
(C) Immadi Narasimha (D) Rajendra Chola

Answer (A)

Sol. Fact

46. Kandariya Mahadev Temple is located at

- (A) Khajuraho (B) Badami
(C) Ajanta (D) Ellora

Answer (A)

Sol. Fact

47. Where is the ancient coastal settlement Arikamedu Located?

- (A) Visakhapatnam (B) Chennai
(C) Puducherry (D) Port Blair

Answer (C)

Sol. Fact

48. Who wrote "Humayun nama"?
- (A) Gulbadan Begam (B) Abul Fazl
(C) Badayuni (D) Barni

Answer (A)

Sol. Fact

49. Who wrote "Kiratarjuniya"?
- (A) Shudraka (B) Bharvi
(C) Kalhan (D) Bilhan

Answer (B)

Sol. Fact

50. Who founded Forward Bloc?
- (A) Subhas Chandra Bose
(B) Jawahar Lal Nehru
(C) Gandhi Ji
(D) Mohammad Ali Jinnah

Answer (A)

Sol. Fact

51. Lothal the port city of Indus Valley civilization is located
- (A) Gujrat (B) Rajasthan
(C) Punjab (D) Haryana

Answer (A)

Sol. Fact

52. Rani Durgawati was the queen of _____
- (A) Garha (B) Riwa
(C) Jaipur (D) Jhansi

Answer (A)

Sol. Fact

53. Who established "Khalsa" in 1699 A.D.?
- (A) Guru Gobind Singh
(B) Guru Angad
(C) Guru Arjan Dev
(D) Guru Teg Bahadur

Answer (A)

Sol. Fact

54. Who was the author of Prayag Prashasti?
- (A) Kalidas (B) Harishena
(C) Varahmihir (D) Shudrak

Answer (B)

Sol. Fact

55. Ashvaghosha writer of Buddhacarita belonged to the court of which Ruler?
- (A) Kanishka
(B) Ashoka
(C) Chandragupta Maurya
(D) Bimbisara

Answer (A)

Sol. Fact

56. The largest area under mangroves is in which of the following state/union territory?
- (A) Andaman and Nicobar
(B) Andhra Pradesh
(C) West Bengal
(D) Gujarat

Answer (C)

Sol. Fact

57. River in its last stage forms-
- (A) Water Fall (B) Flood Plains
(C) Delta or Estuary (D) OX-Bow lake

Answer (C)

Sol. Fact

58. Sundari trees are found in
- (A) Tropical Forest
(B) Himalayan Forest
(C) Mangrove Forest
(D) Tropical deciduous forest

Answer (C)

Sol. Fact

59. Which scale is a Representative Fraction (R.F.)?
- (A) One inch is equal to ten miles
(B) 1 cm = 1 km
(C) One cm for ten km
(D) 1 : 1,00,000

Answer (D)

Sol. Fact

60. Jim Corbett National Park is located in
- (A) Himachal Pradesh (B) Uttarakhand
(C) Jammu & Kashmir (D) Assam

Answer (B)

Sol. Fact

61. Yellow Revolution is related to

- (A) Fruit Production
- (B) Sheep rearing
- (C) Fish Production
- (D) Edible Oil & Oil Seeds

Answer (D)

Sol. Fact

62. Which of the following Indian States is also known as a 'Land of Red river and Blue Hills'?

- (A) Uttarakhand
- (B) Assam
- (C) Meghalaya
- (D) Arunachal Pradesh

Answer (B)

Sol. Fact

63. Which of the following is not a Metallic Mineral?

- (A) Iron
- (B) Manganese
- (C) Gold
- (D) Coal

Answer (D)

Sol. Fact

64. The Clouded Leopard National Park is Situated in which of the following States?

- (A) Tripura
- (B) Uttar Pradesh
- (C) Assam
- (D) Mizoram

Answer (A)

Sol. Fact

65. Silent Valley is located in

- (A) Tamil Nadu
- (B) Kerala
- (C) Karnataka
- (D) Himachal Pradesh

Answer (B)

Sol. Fact

66. River Brahmaputra in Tibet (China) is called

- (A) Meghana
- (B) Tsangpo
- (C) Padma
- (D) Debanga

Answer (B)

Sol. Fact

67. The largest Iron and Steel in Plants in India is

- (A) Tata Iron and Steel Company
- (B) Indian Iron and Steel Company
- (C) Hindustan Steel Ltd.
- (D) Visvesvaraya iron and Steel Company

Answer (A)

Sol. Fact

68. Which of the following Separates India and Sri Lanka?

- (A) The Gulf of Cambay
- (B) The Rann of Kutch
- (C) The Bay of Bengal
- (D) The Gulf of Mannar

Answer (D)

Sol. Fact

69. The best Quality of coal.

- (A) Bituminous
- (B) Anthracite
- (C) Lignite
- (D) Peat

Answer (B)

Sol. Fact

70. Where is Kalpakkam?

- (A) Uttar Pradesh
- (B) Maharashtra
- (C) Gujarat
- (D) Tamil Nadu

Answer (D)

Sol. Fact

71. The word 'Democracy' is focused by "Demos" and "Kratia" which are (both) _____ words

- (A) Greek
- (B) Latin
- (C) Spanish
- (D) English

Answer (A)

Sol. Fact

72. Which Article of the constitution states about the working of an election in India?

- (A) Article - 19
- (B) Article - 300
- (C) Article - 324
- (D) Article - 368

Answer (C)

Sol. Fact

73. 'Fundamental Rights' can be suspended

- (A) By Judiciary
- (B) By Parliament
- (C) In Emergency Period
- (D) None of the above

Answer (C)

Sol. Fact

74. Who is responsible for the registration of the voter?

- (A) Governor
- (B) Voters
- (C) Political Parties
- (D) Election Commission

Answer (D)

Sol. Fact

75. Indian constitution is
- (A) Rigid (B) Flexible
(C) Rigid and flexible (D) None of the above

Answer (C)

Sol. Fact

76. What is marginal productivity of labour in disguised employment?
- (A) Zero (B) Minimum
(C) One (D) Maximum

Answer (A)

Sol. Fact

77. What the industrial unit is called which is run with the help of family members?
- (A) Village industry (B) Agricultural industry
(C) Cottage industry (D) Small industry

Answer (C)

Sol. Fact

78. Where the first mobile bank was established?
- (A) In Ahmednagar district of Maharashtra
(B) In Khargone district of Madhya Pradesh
(C) In Kota district of Rajasthan
(D) In Mysore district of Karnataka

Answer (B)

Sol. Fact

79. When Prime Minister Rozgar Yojana started?
- (A) 15th august 1947 (B) 26th January 1950
(C) 2nd October 1993 (D) 15th august 2015

Answer (C)

Sol. Fact

80. Which of the following sector contributes maximum in gross domestic product of India?
- (A) Primary sector (B) Secondary sector
(C) Tertiary sector (D) Foreign sector

Answer (C)

Sol. Fact

81. If the sum of 14 terms of an A.P. is 1050 and its first term is 10, the 20th term will be
- (A) 140 (B) 160
(C) 180 (D) 200

Answer (D)

Sol. $S_{14} = 1050, a = 10. S_n = \frac{n}{2}[2a + (n-1)d]$

$$1050 = \frac{14}{2}[2 \times 10 + 13 \times d]$$

$$150 = 20 + 13d$$

$$150 - 20 = 13d$$

$$\frac{130}{13} = d = 10$$

$$a_{20} = a + 19d$$

$$= 10 + 19 \times 10$$

$$= 200$$

82. The roots of quadratic equation $ax^2+bx+c=0$ are real and distinct if

(A) $b^2 = 4ac$ (B) $b^2 - 4ac > 0$

(C) $b^2 - 4ac < 0$ (D) None of these

Answer (B)

Sol. For real roots and distinct roots

$$b^2 - 4ac > 0$$

83. If in a triangle, square of longest side is equal to the sum of the squares of the other two sides, then the angle opposite the longest side is

(A) Acute angle (B) Right angle

(C) Obtuse angle (D) None of these

Answer (B)

Sol. Pythagoras Theorem (Converse)

84. $\frac{\tan 65^\circ}{\cot 25^\circ} = ?$

(A) 1 (B) 0

(C) $\frac{1}{2}$ (D) None

Answer (A)

Sol. $\frac{\tan 65^\circ}{\cot 25^\circ} = \frac{\tan(90^\circ - 25^\circ)}{\cot 25^\circ} = \frac{\cot 25^\circ}{\cot 25^\circ}$

85. Which of the following cannot be the probability of an event?

(A) 0.78 (B) $\frac{2}{5}$

(C) 73% (D) -0.78

Answer (D)

Sol. $0 \leq \text{probability of an event} \leq 1$

86. Cube root of 328509 is

- (A) 65 (B) 66
(C) 68 (D) 69

Answer (D)

Sol. $69^3 = 328509$

87. The ratio of angles in a triangle is 1 : 2 : 3, then the largest angle is

- (A) 60° (B) 90°
(C) 120° (D) None of these

Answer (B)

Sol. $\frac{3}{1+2+3} \times 180 = \frac{3}{6} \times 180 = 90$

88. The point of intersection of lines $7x - 15y - 2 = 0$ and $6x + 12y - 18 = 0$ is

- (A) $\left(\frac{-49}{29}, \frac{19}{29}\right)$ (B) $\left(\frac{49}{29}, \frac{19}{29}\right)$
(C) $\left(\frac{49}{29}, \frac{-19}{29}\right)$ (D) None of these

Answer (B)

Sol. $7x - 15y - 2 = 0 \rightarrow X6$

$6x + 12y - 18 = 0 \rightarrow X7$

Subtracting

$$42x - 90y - 12 = 0$$

$$42x + 84y - 126 = 0$$

$$-174y + 114 = 0$$

$$-174 = -114$$

$$y = \frac{114}{174} = \frac{19}{29}$$

$$7x - 15\left(\frac{19}{29}\right) - 2 = 0$$

$$7x = \frac{15 \times 19}{29} + 2 = \frac{285}{29} + 2 = \frac{343}{29}$$

$$x = \frac{49}{29}$$

89. Pair of equations $5x - 8y + 1 = 0$ and

$$3x - \frac{24}{5}y + \frac{3}{5} = 0$$
 have

- (A) No solution (B) Unique solution
(C) Infinite solutions (D) None of these

Answer (C)

Sol. $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

90. The area of the triangle with vertices $(1, -1)$, $(-4, 6)$ and $(-3, -5)$ is

- (A) 20 square unit (B) 22 square unit
(C) 24 square unit (D) 28 square unit

Answer (C)

Sol. area of

$$\Delta = \frac{1}{2} |x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|$$

91. Tenth term of A.P. 2, 7, 12, is

- (A) 42 (B) 47
(C) 37 (D) 52

Answer (B)

Sol. $a_{10} = 2 + 9 \times 5 = 47$

92. With usual meanings of notations, formula for assumed mean method for A.M. is

(A) $\bar{x} = A + \frac{\sum_{i=1}^N f_i d_i}{\sum_{i=1}^N f_i}$ where $d_i = x_i - A$

(B) $\bar{x} = \frac{x_1 + x_2 + \dots + x_n}{N}$

(C) $\bar{x} = \frac{\sum_{i=1}^N f_i x_i}{\sum_{i=1}^N f_i}$

(D) None of these

Answer (A)

93. The value of $\frac{\cos 30^\circ \times \sin 60^\circ}{\cos 60^\circ}$ is

- (A) 0 (B) 0.5
(C) 1 (D) 1.5

Answer (D)

Sol. $\frac{\frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2}}{\frac{1}{2}} = \frac{3}{4} \times \frac{2}{1} = \frac{3}{2}$

94. For individual series 108, 64, 40, 57, 30, 54, 32, 52 Median is :

- (A) 52 (B) 53
(C) 54 (D) 55

Answer (B)

Sol. 30, 32, 40, 52, 54, 57, 64, 108

$$\text{Median} = \frac{52 + 54}{2} = \frac{106}{2} = 53$$

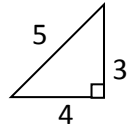
95. If, $\tan \theta = \frac{3}{4}$, then $\sin \theta \times \cos \theta = ?$

- (A) $\frac{10}{25}$ (B) $\frac{11}{25}$
(C) $\frac{12}{25}$ (D) $\frac{13}{25}$

Answer (C)

Sol. $\tan \theta = \frac{3}{4}$

$$\sin \theta \times \cos \theta = \frac{3}{5} \times \frac{4}{5} = \frac{12}{25}$$



96. Total two digit numbers completely divisible by 3 are

- (A) 29 (B) 30
(C) 31 (D) 32

Answer (B)

Sol. 12, 15, 18, 99

$$99 = 12 + (n - 1)3$$

$$n = 30$$

97. $\sin 30^\circ \times \tan 30^\circ \times \cot 30^\circ \times \operatorname{cosec} 60^\circ = \dots\dots\dots$

- (A) $\tan 30^\circ$ (B) $\cot 60^\circ$
(C) $\sin 30^\circ \times \operatorname{cosec} 60^\circ$ (D) All of the above

Answer (D)

Sol. $\sin 30^\circ \times \tan 30^\circ \times \cot 30^\circ \times \operatorname{cosec} 60^\circ$

$$= \frac{1}{2} \times \frac{1}{\sqrt{3}} \times \sqrt{3} \times \frac{2}{\sqrt{3}} = \frac{1}{\sqrt{3}}$$

98. $(3x + 6)(x + 1) + 2x = (x + 5)(x + 4)$ has

- (A) No roots (B) Imaginary roots
(C) Real roots (D) None of these

Answer (C)

Sol. $(3x + 6)(x + 1) + 2x = (x + 5)(x + 4)$

On simplification, $x^2 + x - 7 = 0$

$D = 29 > 0$, therefore real roots

99. When $2x^2 + 3x + 1$ is divided by $x + 2$ then quotient and remainder are :

- (A) $Q = 2x - 1, R = 3$ (B) $Q = x + 1, R = 3$
(C) $Q = 2x + 1, R = 3$ (D) None of these

Answer (A)

Sol. $2x^2 + 3x + 1 = (2x - 1)(x + 2) + 3$

100. The zeros of quadratic polynomial $x^2 + 7x + 10$ will be

- (A) 2 and -5 (B) -2 and 5
(C) -2 and -5 (D) None of these

Answer (C)

Sol. $x^2 + 7x + 10 = 0$

$$x^2 + 2x + 5x + 10 = 0$$

$$(x + 2)(x + 5) = 0$$

Therefore $x = -2, -5$

