

NATIONAL TALENT SEARCH EXAMINATION,

2019-20
(WEST BENGAL-STATE LEVEL)

(FOR STUDENTS STUDYING IN CLASS X)

MENTAL ABILITY TEST (MAT)

Time: 120 Minutes

Full Marks: 100

INSTRUCTIONS TO CANDIDATES

Read the instructions carefully before you start answering the questions. Answers are to be given on a OMR Answer-Sheet provided.

- In this Paper you are to answer 100 questions. Each questions carries 1 (one) mark. You are to answer all the questions.
- Before you proceed to mark in the OMR answer-Sheet, find out the correct answer from the four alternatives (a), (b), (c) and (d) against each question in the Question Booklet. Darken the circle with a Black Ball Point Pen, to the corresponding correct answer for the item in the OMR Answer-Sheet.

(Here 'b' is the correct answer.)

- If more than one circle is encoded or darken against a particular answer, it will be treated as a wrong answer.
- There will be no penalty marks or negative marking for a wrong answer.
- You are to start recording answers with the 'start' instruction from the Officer-in-Charge of your room/hall.
- You are to write your Name and Roll No. in the space provided with for this purpose on the OMR Answer-Sheet. You must encode your Roll No. in OMR Answer Sheet.
- The OMR Answer-Sheet should be handed over to the Invigilator before leaving the Examination Hall. You may take away the used Question Booklet after completion of the examination.

Enrollment No. :

Batch : _____

Name : _____

Candidate's Signature _____ Invigilator's Signature: _____

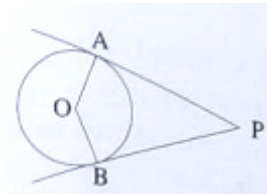
MENTAL ABILITY TEST

(Questions 1 – 15)

DIRECTION: Read the questions 1-15 carefully and give answer by filing the circle of the latter denoting selected answer on the OMR Answer- Sheet.

1. $x^5 - 1$ is divided by $2x + 1$, then the absolute value of the remainder is
 (a) 21 (b) 26 (c) $\frac{33}{12}$ (d) $\frac{33}{22}$
2. A mother was 30 years old when her son was born. Now the sum of ages of mother and son is 40 years. What would be the age of the son after 10 years?
 (a) 5 years (b) 15 years (c) 20 years (d) 10 years
3. If the difference between diameter and circumference of a circle is 60 cm. then the area of the circle is
 (a) 661 square cm (b) 166 square cm (c) 616 square cm (d) 484 square cm
4. A metallic spherical shell of internal and external diameters 4 cm and 8 cm respectively, is melted and recast into the form of a cone of bases diameter 8 cm. The height of the cone is
 (a) 12 cm (b) 14 cm (c) 15 cm (d) 18 cm
5. If median of a distribution is 28 and mean is 27.5, then mode is
 (a) 29.5 (b) 28.5 (c) 29.0 (d) 27.0
6. The value $a^3 + b^3 + c^3 - 3abc$ when $a + b + c = 9$ and $a^2 + b^2 + c^2 = 29$ is
 (a) 9 (b) 3 (c) 27 (d) 81
7. The angles of elevation of top and bottom of a flag kept on a flagpost at 30 metre distance are 45° and 30° respectively of the flag?
 (a) 17.32 metre (b) 14.32 metre (c) 12.68 metre (d) 20.78 metre
8. The average of 11 result is 50. If the average numbers of first six result is 49 and that of last six number is 52, find the sixth result
 (a) 65 (b) 72 (c) 56 (d) 47
9. The roots of $2kx^2 + 5kx + 2 = 0$ are equal if k is equal to
 (a) $\frac{16}{25}$ (b) $\frac{13}{16}$ (c) 2 (d) $1\frac{2}{15}$
10. A fair unbiased die is thrown twice and in both cases the difference of numbers appeared on the upper face was observed. The probability of getting the difference to be 3 is
 (a) $\frac{1}{3}$ (b) $\frac{1}{6}$ (c) $\frac{1}{12}$ (d) $\frac{1}{36}$
11. If $(p + q) : \sqrt{pq} = 2 : 1$, then $p : q$ will be
 (a) 2 : 1 (b) 1 : 2 (c) 1 : 1 (d) 1 : 5

12. In a given figure. PA and PB are tangents from P to a circle with centre O. If $\angle AOB = 130^\circ$, then find $\angle APB$.

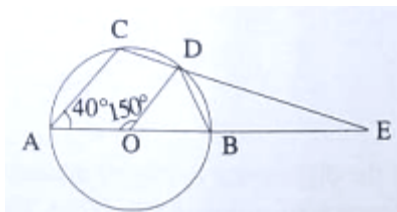


- (a) 40° (b) 55° (c) 50° (d) 60°

13. If $\cos^4 \theta - \sin \theta = \frac{1}{3}$, then the value of $\tan^2 \theta$ will be

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

- 14.



In the figure the value of $\angle BED$ is

- (a) 25° (b) 40° (c) 35° (d) 30°

15. If $(1 + 4x^2)\cos \theta = 4x$, then $\frac{1 + 2x}{1 - 2x} =$

- (a) $\operatorname{cosec} \theta + \cot \theta$ (b) $\operatorname{cosec} \theta - \cot \theta$ (c) $\sec \theta + \tan \theta$ (d) $\sec \theta - \tan \theta$

(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 a left set of word of ‘:’. Fill the circle of the letter denoting your selected answer n the OMR Answer-Sheet.

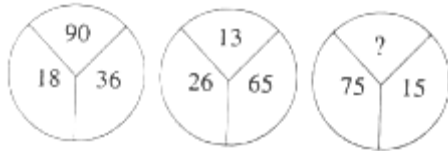
16. Lamp : Oil :: Bulb : ?
 (a) Electricity (b) Bright (c) Holder (d) Switch
17. Whale : Mammal :: Frog ?
 (a) Amphibian (b) Reptile (c) Fish (d) Molluse
18. King : Place :: Eskimo : ?
 (a) Cavaran (b) Asylum (c) Monastery (d) Igloo
19. Cobbler : Leather :: Carpenter : ?
 (a) Paper (b) Wood (c) Hammer (d) Cloth
20. Stethoscope : Heartbeat :: ? : Temperature
 (a) Heat (b) Mercury (c) Scale (d) Thermometer
21. Light : Darkness :: Knowledge : ?
 (a) Ignorance (b) Intelligence (c) Brightness (d) Creativity

22. 841 : 29 :: 289 ?
 (a) 23 (b) 33 (c) 17 (d) 13
23. C : I :: D ?
 (a) L (b) P (c) M (d) N
24. Heart : Cardiologist :: Kidney : ?
 (a) Endocrinologist (b) Orthodontist (c) Nephrologists (d) Urologist
25. Poet : Poem :: Dramatist : ?
 (a) Dialogue (b) Stage (c) Play (d) Direction

(Questions 26-55)

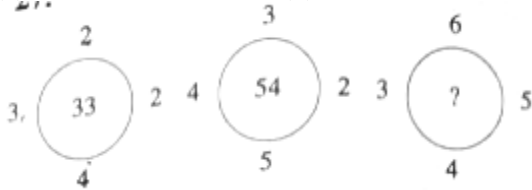
DIRECTION: In question 26-55, number are placed in figure on the basis of some rules. One place in the figure is indicated by the interrogation sign(?). Find out the correct alternative to replace the question mark and indicate your answer by filling the circle of the corresponding letter of alternatives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

26.



- (a) 105 (b) 60 (c) 30 (d) 45

27.



- (a) 94 (b) 86 (c) 82 (d) 78

28.



- (a) 220 (b) 224 (c) 221 (d) 225

29.



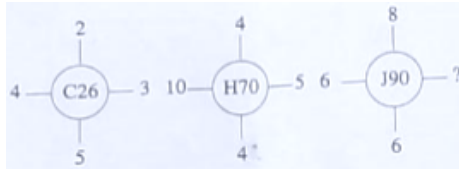
- (a) 12 (b) 15 (c) 18 (d) 14

30.

31	17	58	87
68	19	61	56
91	22	70	50
10	142	11	?

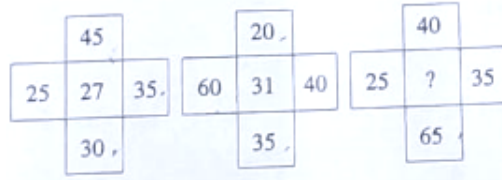
- (a) 3 (b) 6 (c) 7 (d) 9

31.



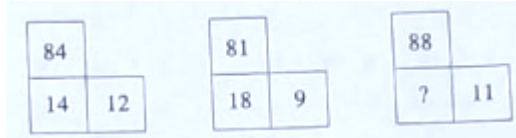
- (a) 2 (b) 3 (c) 4 (d) 5

32.



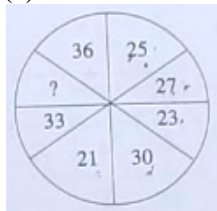
- (a) 33 (b) 36 (c) 45 (d) 60

33.



- (a) 16 (b) 61 (c) 21 (d) 81

34.



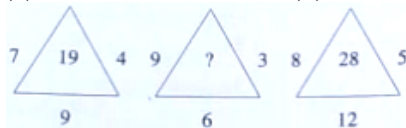
- (a) 35 (b) 32 (c) 22 (d) 19

35.



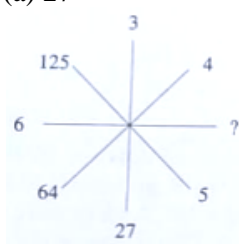
- (a) 124 (b) 125 (c) 126 (d) 224

36.



- (a) 27 (b) 21 (c) 28 (d) 33

37.



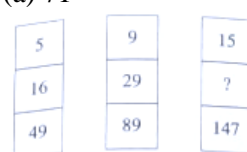
- (a) 164 (b) 181 (c) 216 (d) 200

38.



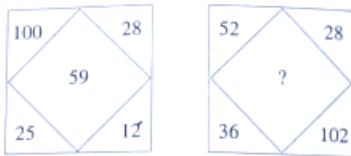
- (a) 71 (b) 59 (c) 62 (d) 55

39.



- (a) 48 (b) 45 (c) 51 (d) 54

40.



(a) 50

(b) 90

(c) 218

(d) 64

41.



(a) 27

(b) 35

(c) 54

(d) 30

42.

5	8	12
7	1	4
9	3	?
108	27	96

(a) 4

(b) 5

(c) 3

(d) 6

43.

B	F	K
E	I	N
?	N	S

(a) K

(b) O

(c) F

(d) J

44.

Z	A	Y	B
T	E	S	F
Q	L	P	?

(a) M

(b) N

(c) P

(d) O

45.

7	3	8
4	9	6
5	1	2
90	91	?

(a) 92

(b) 94

(c) 104

(d) 93

46.

2	7	14
3	4	?
75	165	285

(a) 7

(b) 5

(c) 1

(d) 4

47.

2	1	4	6	?	3
6	0	60	210	120	24

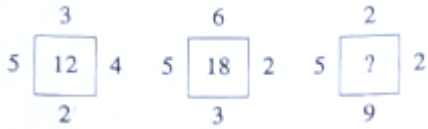
(a) 2

(b) 8

(c) 5

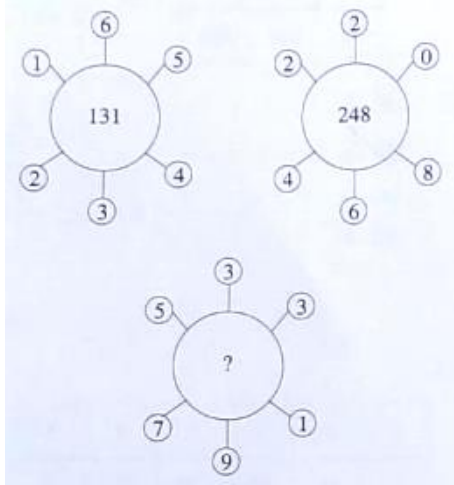
(d) 7

48.



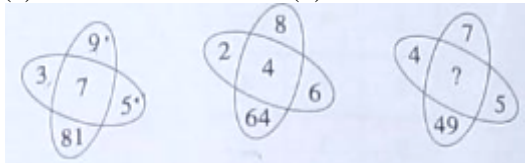
- (a) 15 (b) 18 (c) 17 (d) 16

49.



- (a) 132 (b) 320 (c) 274 (d) 262

50.



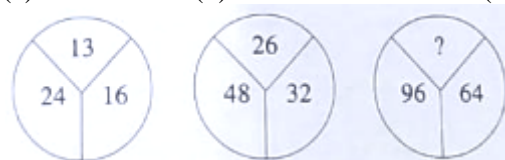
- (a) 1 (b) 8 (c) 6 (d) 4

51.

3C	27D	9E
7I	21K	3M
4D	?	7J

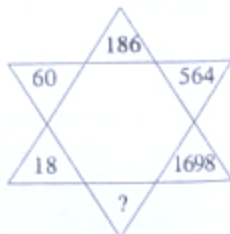
- (a) 11 E (b) 28G (c) 35I (d) 48F

52.



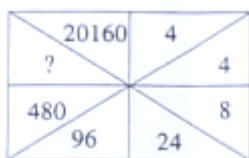
- (a) 60 (b) 39 (c) 32 (d) 52

53.



- (a) 5052 (b) 5100 (c) 5094 (d) 4860

54.



- (a) 860 (b) 1140 (c) 2880 (d) 3240

55.



(a) 29

(b) 23

(c) 35

(d) 26

(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 replace the question mark in the given series.

56. 132, 253, 374, 495, ?

(a) 5165

(b) 5123

(c) 5116

(d) 5102

57. 8, 18, 32, 50, 72, ?

(a) 76

(b) 98

(c) 80

(d) 70

58. 1, 0, 3, 2, 5, 6, ?, 12, 9, 20

(a) 9

(b) 10

(c) 7

(d) 8

59. 7, 8, 18, 57, ?, 1165

(a) 174

(b) 232

(c) 224

(d) 228

60. 10, 11, 14, 23, 50, ?

(a) 10

(b) 104

(c) 70

(d) 131

61. 4, 8, 28, 80, 244, ?

(a) 278

(b) 428

(c) 628

(d) 728

62. 1, 1, 2, 6, 24, ?, 720

(a) 100

(b) 104

(c) 108

(d) 120

63. 2, 7, 27, 107, 427, ?

(a) 1262

(b) 1707

(c) 4027

(d) 4207

64. 3, 8, 18, ?, 53, 78

(a) 30

(b) 35

(c) 33

(d) 32

65. 11, 29, 55, ?, 131

(a) 110

(b) 81

(c) 89

(d) 78

66. 198, 194, 185, 169, ?

(a) 92

(b) 136

(c) 144

(d) 112

67. 4, 11, 30, 67, 128, ?

(a) 219

(b) 228

(c) 231

(d) 237

68. 17, 43, 81, 131, ?

(a) 375

(b) 468

(c) 300

(d) 193

69. How many terms are there in the series 4, 7, 10, 13, ..., 148?

(a) 25

(b) 49

(c) 37

(d) 51

 70. In the series 4, 10, 16, What will be the 23rd term?

(a) 136

(b) 150

(c) 161

(d) 125

(Questions 71 – 80)

DIRECTION: In each of the question 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 item and indicate your answer by filling the circle of the corresponding letter on the OMR Answer-Sheet.

71. (a) Iron (b) Steel (c) Gold (d) Tin
72. (a) RKD (b) UNG (c) MTF (d) SLE
73. (a) Botany (b) English (c) Physics (d) Chemistry
74. (a) Mumbai (b) Chennai (c) Kolkata (d) Bengaluru
75. (a) Carrom (b) Glof (c) Cricket (d) Hockey
76. (a) Eye (b) Ears (c) Thorat (d) Nose
77. (a) Cumin (b) Groundnut (c) Clove (d) Pepper
78. (a) Temple (b) Worship (c) Church (d) Mosque
79. (a) 70, 80 (b) 54, 62 (c) 28, 32 (d) 42, 24
80. (a) Square (b) Circle (c) Parallelogram (d) Rectangle

(Question 81-83)

DIRECTION: Choose the correct one.

81. If the clock reads 6:20 and if the minute hand points North-East, in which direction will the hour hand point?
(a) West (b) South-East (c) East (d) North-East
82. A boy start walking towards West, he turns right and again he turns right and then turns left at last. Towards which direction is he walking now?
(a) West (b) North (c) South (d) East
83. Arun travels 8 km towards the North, turns left and travels 3 km and then again turns right covers another 4 km. He then turn right and travels another 3 km. How far is he from the starting point?
(a) 18 km (b) 11 km (c) 12 km (d) 15 km

(Question 84 & 85)

DIRECTION: Choose the correct one.

84. Arrange the given words in the sequence in which they occur in dictionary and then choose the correct sequence.
1. Leaf
 2. Learned
 3. Leave
 4. Leak
 5. Leader
- (a) 5,1,4,2,3 (b) 5,1,4,3,2 (c) 3,5,1,4,2 (d) 1,4,2,3,5

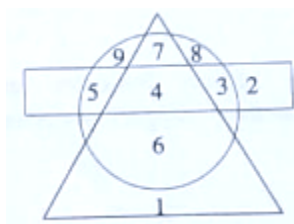
85. Arrange the given words in the sequence in which they occur in dictionary and then choose the correct sequence.
1. Select
 2. Seldom
 3. Send
 4. Selfish
 5. Selter
- (a) 1,2,4,5,3 (b) 2,1,5,4,3 (c) 3,5,4,1,2 (d) 5,3,2,1,4

(Questions 86 – 90)

86. If P means $-$, Q means $+$, R means \div and S means \times , then what is the value of $18P6Q4S6R2$?
- (a) 24 (b) 12 (c) 26 (d) 128
87. If $5*6 = 35, 8*4 = 28, 6*8 = ?$
- (a) 46 (b) 34 (c) 23 (d) 38
88. If '+' stands for 'multiplication', '<' stands for 'division', ' \div ' stands for 'subtraction', 'greater than', identify which expression is correct.
- (a) $20 - 4 \div 4 + 8 < 2 \times 26$ (b) $20 \times 8 + 15 < 5 \div 9 - 8$
 (c) $20 < 2 + 10 \div 4 - 6 \times 100$ (d) $20 < 5 + 25 \div 10 - 2 \times 96$
89. If ' \div ' means '+', '-' means ' \div ', ' \times ' means '-' and '+' means ' \times '
- $32 \div 8 - 4 \times 12 + 4 = ?$
- (a) 12 (b) 21 (c) -41 (d) -14
90. Which one of the following will be possible when you interchange the numbers 4 and 5 and the signs '+' and ' \times '?
- (a) $5 \times 4 + 10 = 30$ (b) $10 \times 4 + 5 = 50$
 (c) $20 + 5 \times 4 = 85$ (d) $5 + 51 \times 4 = 90$

(Questions 91-95)

DIRECTION: Study the following figure carefully and answer the questions given below it. The rectangle represents employed persons and the triangle represents educated persons and the circle represents villagers.



91. Which regions indicate villagers are neither employed nor educated?
- (a) 6, 1 (b) 8, 9 (c) 3, 2 (d) 7, 8
92. Which regions represent educated persons are villagers?
- (a) 7, 4 (b) 4, 6 (c) 6, 1 (d) 7, 4, 6
93. Which region represents educated persons are both villagers and employed?
- (a) 2 (b) 8 (c) 4 (d) 9

94. Which region represents educated persons are neither villagers nor employed?
(a) 9 (b) 1 (c) 3 (d) 6
95. Which region indicates employed persons are neither villagers nor educated?
(a) 8 (b) 7 (c) 9 (d) 2

(Questions 96 & 97)

DIRECTION: Choose the correct one.

96. If $A + B$ means a is the brother of B, $A - B$ means a is the sister of B and $A \times B$ means A is the father of B, which of the following means that C is the son of A?
(a) $A - B \times C + B$ (b) $B - C + A \times B$ (c) $A + B - B \times C$ (d) $A \times B - C + B$
97. Looking at a photograph a person said "I have no brother or sister but that man's father is my father's son". At whose photograph was the person looking at?
(a) His son's (b) His nephew's (c) His father's (d) His own

(Questions 98 – 100)

DIRECTION: A is B's brother, C is A's mother, D is C's father and E is B's son

98. How is E related to A?
(a) Cousin (b) Nephew (c) Uncle (d) Grandson
99. How is D related to B?
(a) Father (b) Uncle (c) Brother (d) Grandfather
100. How is E related to C?
(a) Uncle (b) Nephew (c) Cousin (d) Grandson