PART-I: MENTAL ABILITY TEST
(For Students of Class X)

Time : 120 Minutes  Max. Marks : 100

INSTRUCTIONS TO CANDIDATES
Read the following instructions carefully before you open the question booklet.

1. Answers are to be given on the same OMR Answer Sheet provided for Part-I.
2. There are 100 questions in this test. All are compulsory.
3. This booklet contains questions on Mental Ability Test.
4. Choose the correct answer from the options given for each question and darken the corresponding circle with black ball point pen in the OMR Answer Sheet.
5. Since the time allotted for this Question Paper is very limited you should make the best use of it by not spending too much time on any one question.
6. If you do not know the answer to any question, do not waste time on it and pass on to the next one. If time permits, you can come back to the questions, which you have left in the first instance and attempt them.
7. Rough work can be done anywhere in the Question Booklet but not on the OMR Sheet/loose paper.
8. Every correct answer will be awarded one mark.
9. Please return the OMR Answer Sheet only to the invigilator after completion of the test. You can retain the Question Booklets.
10. English version of the Question Paper will be considered as final in case of any dispute arising out of variation in translated version.
11. Quote your seven digit Roll Number without fail for any future correspondence.

PLEASE TURN OVER THE PAGE AND START ANSWERING.
MENTAL ABILITY TEST / என்றுற்றுணி கொண்டு

Direction: (Question number 1 - 5)

In each question the numbers/letters are arranged in a sequence based on certain principle. Select the answer from the four alternatives given under each sequence for the term marked by ?

1. 19, 24, 31, 42, 55, 72, ?
   (1) 83  (2) 89  (3) 91  (4) 93

2. 10, 58, 105, ?, 196, 240, ...
   (1) 150  (2) 151  (3) 154  (4) 147

   (1) B  (2) F  (3) D  (4) A

4. 1, 4, 13, 40, 121, ?
   (1) 202  (2) 364  (3) 148  (4) 210

5. 0, 1, 2, 3, 6, 11, 20, ?
   (1) 31  (2) 34  (3) 37  (4) 22
Direction : (Question number 6 and 7)

The diagram and the numbers/letters follow certain principle. Select the missing number/letter indicated by question mark?

6. 6, 7, 10, 8, 16, 15, 26, 23, 42, 38, 68, ___ ?
   (1) 61  (2) 80  (3) 106  (4) 120

7.  
   \[
   \begin{array}{ccc}
   2 & 7 & 7 \\
   5 & 37 & 9 \\
   6 & 11 & 23 \\
   \end{array}
   \quad
   \begin{array}{ccc}
   2 & 7 & 7 \\
   5 & 37 & 9 \\
   6 & 11 & 23 \\
   \end{array}
   \quad
   \begin{array}{ccc}
   2 & 7 & 7 \\
   5 & 37 & 9 \\
   6 & 11 & 23 \\
   \end{array}
   \]

   (1) 20  (2) 59  (3) 85  (4) 10

Direction : (Question number 8 - 15)

First two terms are connected by some relationship. The same relationship is applicable for the next terms in which one is blank space. Identify the suitable term from the given four alternatives for the blank space.

8. PEN : WRITING : : CYCLE : ________
   (1) REPAIRING  (2) CAR  (3) RIDING  (4) ROAD

   (1) REPAIRING  (2) CAR  (3) RIDING  (4) ROAD
9. EYE : FACE : :
   (1) RING : FINGER
   (2) STEM : ROOT
   (3) KNOB : DOOR
   (4) SHOE : FOOT

10. WING : BEAK : :
    (1) BUTTON : SHIRT
    (2) PLUTO : VENUS
    (3) HOUSE : CHIMNEY
    (4) BIRD : CAGE

11. ROOM : HOUSE : :
    (1) REFRIGERATOR : KITCHEN
    (2) CHAIR : ROOM
    (3) ROOF : BUILDING
    (4) WHEEL : CHAIR

12. 5 : 29 : ? : 41
    (1) 30
    (2) 6
    (3) 7
    (4) 4

13. CANADA : DOLLAR : GERMANY :
    (1) YEN
    (2) DOLLAR
    (3) DEUTSCHE MARK
    (4) RIYAL
14. CARBOHYDRATE : POTATO : : FAT :

(1) CARROT  (2) TOMATO  (3) WATER  (4) GHEE

15. DAVIS CUP : LAWN TENNIS : : DEODHAR TROPHY :

(1) FOOTBALL  (2) CRICKET  (3) HOCKEY  (4) SHUTTLE COCK

16. There are four prime numbers written in ascending order. The product of the first three is 1001 and that of the last three is 2431. The last number is :

(1) 17  (2) 19  (3) 23  (4) 13

17. The largest number which divides 62, 132 and 237 to leave the same remainder in each case is :

(1) 51  (2) 35  (3) 8  (4) 53

18. Traffic lights at three different road crossings change after every 48 sec, 72 sec and 108 sec respectively. If they all change simultaneously at 7:00:00 hours then at what time will they again change simultaneously ?

(1) 7:14:00 Hrs  (2) 7:14:12 Hrs  (3) 7:07:12 Hrs  (4) 7:09:12 Hrs
19. A student got twice as many sums wrong as he got right. If he attended 60 sums in all, how many did he solve correctly?

(1) 12  (2) 16  (3) 24  (4) 20

20. \[ \frac{1}{5 \times 6} + \frac{1}{6 \times 7} + \frac{1}{7 \times 8} + \ldots + \frac{1}{24 \times 25} = ? \]

(1) 0.36  (2) 0.16  (3) 0.016  (4) 1.6

21. If \[ \frac{2x}{1 + \frac{1}{1 + \frac{x}{1 - x}}} = 3 \] then the value of \( x \) is:

(1) \( \frac{5}{6} \)  (2) \( \frac{6}{5} \)  (3) \( \frac{4}{5} \)  (4) \( \frac{5}{4} \)

22. If \( \times \) means +, \( + \) means −, − means \( \times \) and + means + then \( 36 + 18 \div 9 - 3 \times 26 \) is:

(1) −40  (2) 78  (3) −1  (4) 1

19. ஒரு பட்டியலில் சிற்பத்தடை நூற்று கண்டு கல்விக் கூட்டு கருத்துக்காக பிறந்து கூறப்படும் குறுக்கு கூறு காரணிகள். நான்கு பட்டியல்வெளியை 60 கல்விக்காரனின் சிற்பத்தடை நூற்று கண்டு கல்வி கூட்டு காரணிகள் தவறிக்கேற்கின்றன:

(1) 12  (2) 16  (3) 24  (4) 20

20. \[ \frac{1}{5 \times 6} + \frac{1}{6 \times 7} + \frac{1}{7 \times 8} + \ldots + \frac{1}{24 \times 25} = ? \]

(1) 0.36  (2) 0.16  (3) 0.016  (4) 1.6

21. \[ \frac{2x}{1 + \frac{1}{1 + \frac{x}{1 - x}}} = 3 \] என்றும் \( x \)-த் தமிழ்:

(1) \( \frac{5}{6} \)  (2) \( \frac{6}{5} \)  (3) \( \frac{4}{5} \)  (4) \( \frac{5}{4} \)

22. \( \times \) சிற்பத்தடை +, \( + \) சிற்பத்தடை −, − சிற்பத்தடை \( \times \) மற்றும் + சிற்பத்தடை நூற்று. \( 36 + 18 \div 9 - 3 \times 26 \) கோட்டு காரணிகள்.

(1) −40  (2) 78  (3) −1  (4) 1
23. Notebooks were distributed equally among children of a class. The notebooks each child got was one-eighth of the number of children. If the number of children is half, each child would have got 16 notebooks. The total number of notebooks distributed is:

(1) 512   (2) 312   (3) 248   (4) 428

24. If \( x = \frac{\sqrt{5} + \sqrt{4}}{\sqrt{5} - \sqrt{4}} \) and \( y = \frac{\sqrt{5} - \sqrt{4}}{\sqrt{5} + \sqrt{4}} \) then \( x^2 + y^2 \) is:

(1) 322   (2) 100   (3) 312   (4) \( 8\sqrt{5} \)

25. If \( \sqrt{13} = 3.605 \) and \( \sqrt{130} = 11.40 \) find \( \sqrt{1.3} + \sqrt{1300} + \sqrt{0.013} \):

(1) 37.34   (2) 37.034   (3) 37.0034   (4) 37.304

26. \( \frac{1}{\sqrt{9} - \sqrt{8}} - \frac{1}{\sqrt{8} - \sqrt{7}} + \frac{1}{\sqrt{7} - \sqrt{6}} - \frac{1}{\sqrt{6} - \sqrt{5}} + \frac{1}{\sqrt{5} - \sqrt{4}} = ? \)

(1) \( \sqrt{8} \)   (2) 5   (3) 3   (4) -3
27. \[ \sqrt{\frac{(0.03)^2 + (0.21)^2 + (0.065)^2}{(0.003)^2 + (0.021)^2 + (0.0065)^2}} = ? \]

(1) \( \frac{1}{10} \)  
(2) 100 
(3) 10  
(4) \( \frac{1}{100} \)

28. A lead pencil is in the shape of a right circular cylinder. The pencil is 28 cm long and its radius is 3 mm. If the lead is of radius 1 mm, the volume of the wood used is:

(1) 0.352 cm\(^3\)  
(2) 7.04 cm\(^3\)  
(3) 3.52 cm\(^3\)  
(4) 70.4 cm\(^3\)

29. The difference between a two digit number and the number obtained by interchanging the positions of its digits is 36. The difference between the two digits of that number is:

(1) 4  
(2) 3  
(3) 6  
(4) 5
30. A and B are two stations 390 km apart. A train starts from A at 10 am and travels towards B at 65 kmph. Another train starts from B at 11 am and travels towards A at 35 kmph. At what time do they meet?

(1) 3.15 pm  (2) 2.15 pm
(3) 4.15 pm  (4) 12.15 pm

31. A cone, a hemisphere and a cylinder have equal bases. If the heights of the cone and the cylinder are equal to its common radius, then the ratio between their volumes is:

(1) 2 : 3 : 1  (2) 3 : 2 : 1
(3) 1 : 2 : 3  (4) 2 : 1 : 3

32. One side of a rhombus is 20 cm and one diagonal is 24 cm. Find the area of the rhombus.

(1) 200 cm²  (2) 384 cm²
(3) 288 cm²  (4) 348 cm²

30. A முறையில் B என்று 390 கி.மீ. விட்டவளியில் வளங்கும் தோட்டம் இருந்தும் தோட்டம் உள்ளது. ஒளி விளக்கு அடர்ந்த காலம் 10 மணிக்கு A-போது தோட்டம் B-போது தோட்டம் உள்ளது 65 கி.மீ. அவ்வில் பார்ந்து நீக்கு விளக்கம் அடர்ந்த காலம் 11 மணிக்கு தோட்டம் A-போது தோட்டம் உள்ளது 35 கி.மீ. அவ்வில் பார்ந்து நீக்கு விளக்கம். அவ்வில் வருமாறு நீக்குவது?

(1) 3.15 pm  (2) 2.15 pm
(3) 4.15 pm  (4) 12.15 pm

31. கொண்டாட்டம், கோள் ஆம்பாசாகலத்தும் மும்பாட்டின் விட்ட விளக்காகத்தும் விளக்கம். கொண்டாட்டம் விளக்கம், மும்பாட்டின் விளக்கம் அம்மாட்டில் மும்பாட்டின் விளக்கம் கோள் அம்மாட்டில் கொண்டாட்டம் விளக்காகத்தும்:

(1) 2 : 3 : 1  (2) 3 : 2 : 1
(3) 1 : 2 : 3  (4) 2 : 1 : 3

32. சதுர கருத்தோட்டத்தில் ஒரு பக்கம் 20 மீ. கோட்டு விளக்காகத்தும் அடர் 24 மீ. விளக்கம், அதில் பார்ப்பது:

(1) 200 மீ.²  (2) 384 மீ.²
(3) 288 மீ.²  (4) 348 மீ.²
Direction : (Question number 33 - 37)

If the English alphabets A to Z have numerical value from 0 to 25 respectively denoted by \( \gamma(A) = 0 ; \gamma(B) = 1 \), etc. \( \gamma(Z) = 25 \) and sum of two alphabets \( a \) and \( b \) is defined as \( a + b = c \) if \( \gamma(c) = \gamma(a) + \gamma(b) \) then answer the question 33 - 37.

33. E + K = ?
   (1) O  (2) M  (3) N  (4) P

34. B + U = ?
   (1) U  (2) W  (3) V  (4) X

35. A + C + F = ?
   (1) O  (2) G  (3) H  (4) I

36. L - S = ?
   (1) U  (2) T  (3) R  (4) S

37. -D - P = ?
   (1) I  (2) J  (3) H  (4) K
38. In a certain code GOOD is written as JRRG and JACK is written as MDFN, then FRUIT is written as:

(1) IUYLW  (2) IUXLW  (3) IUXMW  (4) IVXLW

39. In a certain code JUNGLE is written as JNLEGU then FOREST is written as:

(1) ROFEST  (2) FORTSE  (3) TSEROF  (4) FRSTEO

40. The 10th consonant from the first consonant of the English alphabet is:

(1) N  (2) M  (3) Q  (4) R

41. What letters appear in ECONOMY and not in SECOND?

(1) MY  (2) NM  (3) EY  (4) CN

42. Which letter would divide the letters between N and Z into two equal halves?

(1) V  (2) I  (3) T  (4) W
Direction: (Question number 43 - 46)
Pick the odd item from the following sets.

43. (1) Buddhism  (2) Jainism  (3) Pessimism  (4) Hinduism
44. (1) Hunger  (2) Cakes  (3) Vegetables  (4) Pastries
45. (1) King  (2) Queen  (3) Princess  (4) Labourer
46. (1) Egypt  (2) West Bengal  (3) China  (4) India

Direction: (Question number 47 - 54)
Figures A and B are related in some manner. In the same manner figures C and D are related. Choose the figure D in the given four alternatives.
Direction: (Question number 55 - 58)

All the four figures in the set of problem figures have a definite sequence. Discover the sequence and pick-up one figure from answer figures that completes the series.
Direction: (Question number 59 and 60)
Pick the figure not in same category.

59. 
(1) (2) (3) (4)

Direction: (Question number 61 - 64)
Match the following based on common characteristics:

61. (1) (2) (3) (4)

62. (1) (2) (3) (4)

63. (1) (2) (3) (4)

64. (1) (2) (3) (4)
65. First two words are related to each other. Choose the word which bears the same relationship.

Monk : Brotherhood : : letter : ________
(1) jumble (2) gang (3) album (4) budget

Direction : (Question number 66 - 70)
Read the following information carefully and answer the question.

(i) Five persons J, K, L, M and N participated in a quiz contest.

(ii) One is master of sports, one is master of current events and one is master of art and culture.

(iii) J and M are unmarried ladies and do not hold command in any subject.

(iv) N is the husband in a married couple.

(v) K is the brother of L and is neither master of current events nor art and culture.

(vi) None of the ladies has command over current events and sports.

66. Who is the master of sports?

(1) M (2) L (3) J (4) K

CODE X | I | 18
67. Who is the master of art and culture?
   (1) N  (2) L
   (3) K  (4) M

68. Who is the master of current events?
   (1) N  (2) M
   (3) J  (4) L

69. Wife of N is:
   (1) K
   (2) J
   (3) Data inadequate
   (4) L

70. The three ladies are:
   (1) J, K and M
   (2) J, K and L
   (3) J, L and M
   (4) K, L and M

71. If A is brother of F and F is the daughter of D and P is brother of D. How is P related to A?
   (1) Father
   (2) Uncle
   (3) Grand-father
   (4) Co-brother
Direction: (Question number 72 - 75)
Observe the diagram carefully and answer the following questions:

Let A - denote the set of persons who speak Tamil
B - who speak English
C - Who speak Malayalam and
D - Set of people who speak Telugu

72. The number of people who can speak both Tamil and English is:
   (1) 12  (2) 4  (3) 1  (4) 6

73. Find the number of people who can speak English, Malayalam and Telugu.
   (1) 4  (2) 9  (3) 6  (4) 82

74. Find the number of people who can speak either English or Malayalam.
   (1) 66  (2) 53  (3) 60  (4) 56
75. If the total population is 100, how many do not speak either language?

(1) 2  (2) 0  
(3) 1  (4) 4

Direction: (Question number 76 and 77)

76. Find the missing terms in the table which follows some pattern.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>5</td>
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<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>y</td>
</tr>
<tr>
<td>11</td>
<td>9</td>
</tr>
</tbody>
</table>

(1) \(x = 3, y = 35\)  
(2) \(x = 35, y = 3\)  
(3) \(x = 12, y = 12\)  
(4) Data insufficient

77.  

<p>| | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>0</td>
<td>-2</td>
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<tr>
<td>2</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>-6</td>
<td>0</td>
</tr>
</tbody>
</table>

(1) 5  (2) -5  (3) 4  (4) -4
78. Select any one alternative whose alphabets when placed at the missing places, complete the series.

a _ aa _ a _ baa _ aaba
(1) bbba (2) bbab
(3) bbaa (4) baab

Direction: (Question number 79 and 80)
Find the water image of the following questions.

79. The water image of APPLE79 is:
(1) A_b_l_E_6 (2) V_b_b_E_6
(3) V_d_d_E_6 (4) A_d_d_E_6

80. TRUTH
(1) i_k_n_l_h (2) l_r_u_n_h
(3) i_k_u_n_t_h (4) T_R_U_T_H

Direction: (Question number 81 - 84)
Read the relations carefully and answer the questions.

☐ is greater than
\(\triangle\) is smaller than
\(\odot\) is equal to
\(\neq\) is not equal to

81. If \(A \square B; C \triangle B\) and \(D \odot C\) then:
(1) \(C \triangle A\) (2) \(D \square A\)
(3) \(C \neq D\) (4) \(A \odot C\)
82. If $A \neq C$; $C \Delta B$ and $B \odot A$ then:

1. $A \odot C$  
2. $A \Delta C$  
3. $B \square A$  
4. $A \square C$

83. If $A \Delta C$, $B \square C$ and $B \odot E$ then:

1. $A \square E$  
2. $A \Delta E$  
3. $A \odot E$  
4. $A \odot B$

84. $A \square O$ and $AB \square AC$ then:

1. $(A+B) \square (C+D)$  
2. $(B+D) \odot (C+D)$  
3. $(B+D) \square (C+D)$  
4. $(B+D) \Delta (C+D)$
Direction: (Question number 85 - 89)

Read the statements and answer the questions.

(i) A family consists of 6 members P, Q, R, S, T and U.
(ii) The family consists of only two female members.
(iii) S is father of R, who is brother of T.
(iv) T is daughter of U.
(v) Q and P are grandsons of S.
(vi) P is a son of T.

85. The female members of the family are:
   (1) T and R  (2) T and U  (3) T and P  (4) T and S

86. The relationship of S to U is:
   (1) husband  (2) daughter  (3) son  (4) wife

87. The relationship of P to Q is:
   (1) sister  (2) father  (3) brother  (4) mother
88. The male members of the family are:

(1) S, R, Q, P
(2) P, Q, R, U
(3) Q, R, U, T
(4) P, R, S, T

89. T is a sister of:

(1) U
(2) R
(3) Q
(4) P

90. Mahesh starts walking towards east and after walking 30 m takes right turn and walks again 30 m. Then he turns left and walks 30 m. Again he takes left turn and after walking 15 m finally turn to his left and walks 60 m. How far and in which direction is Mahesh from the starting point?

(1) 20 m North
(2) 30 m West
(3) 30 m South
(4) 15 m South
Direction: (Question number 91 and 92)

Two statements (i) and (ii) are followed by two conclusions numbered (I) and (II). Choose the option which logically follows:

91. Statements:
(i) Some goats are sheeps.
(ii) All sheeps are cows.

Conclusions:
(I) All cows are sheeps.
(II) Some goats are cows.
(1) (I) only true
(2) (II) only true
(3) (I) and (II) are true
(4) Both (I) and (II) are not true

92. Statements:
(i) All mangoes are apples.
(ii) Some grapes are apples.

Conclusions:
(I) All apples are mangoes.
(II) Some apples are mangoes.
(1) (I) only true
(2) (I) and (II) are true
(3) (II) only true
(4) none of these are true
93. The number of triangles in \( \text{F}2 \text{E} \text{I} (2) 4 \) \( (4) 12 \) is:

(1) 10    (2) 4
(3) 6       (4) 12

94. Two positions of dice are shown below. How many points will appear on the opposite to the face containing 5?

(1) 3    (2) 1
(3) 2       (4) 4

95. Which digit will appear on the face opposite to the face with number 4?

(1) 3    (2) 5
(3) 6       (4) 2/3
96. Find the mirror image of “MALAYALAM”.

1. MALAYALAM
2. MAJAYAJAM
3. MVAYALAYAM
4. MAGAYAGAM

97. Find the mirror image of “EFFECTIVE”.

1. EFITCEFE
2. EVITCEFFE
3. EFITCEFE
4. EFITCEFE

98. Find the mirror image of “MAGAZINE”.

1. ENIZACANI
2. MAGAZINE
3. ENIZACANI
4. MAGAZINE

96. “MALAYALAM” வாக்கின் மற்றுமையைக் காண்க.

1. MALAYALAM
2. MAJAYAJAM
3. MVAYALAYAM
4. MAGAYAGAM

97. “EFFECTIVE” வாக்கின் மற்றுமையைக் காண்க.

1. EFITCEFE
2. EVITCEFFE
3. EFITCEFE
4. EFITCEFE

98. “MAGAZINE” வாக்கின் மற்றுமையைக் காண்க: 

1. ENIZACANI
2. MAGAZINE
3. ENIZACANI
4. MAGAZINE
99. If a clock shows 6.45 AM, what is the angle between the needles?

(1) 90°  (2) 45°  
(3) 22.5°  (4) 67.5°

100. A ladder leaning against a vertical wall makes an angle of 60° with the ground. If the foot of the ladder is 3.5 m away from the wall, the length of the ladder is:

(1) 7 m  (2) 3.5 m  
(3) 14 m  (4) \( \frac{7}{\sqrt{3}} \) m
சிற்றுருக்கு பகுதி (சீர்பார்வை விளக்களடை)

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