DO NOT OPEN THE SEAL UNTIL INSTRUCTED TO DO SO.

NTSE (E)

NTSE - NOV, 2018

Medium : English

MENTAL ABILITY TEST

Paper - I

Candidate's Roll Number

Time allowed: 120 Minutes

Total Questions: 100

Minimum Marks: 100

INSTRUCTION: Please check that OMR Answer Sheet No. and Question Booklet No. match with each other. If they do not match immediately replace the Question Booklet and OMR Answer Sheet. Candidate should fill the correct Question Booklet No. in OMR Answer Sheet.

Instructions to Candidates

Read the following instructions carefully before you answer the questions. Answers are to be SHADED on a SEPARATE OMR Answer sheet given, with a HB pencil. Read the Instructions printed on the OMR sheet carefully before answering the questions.

1. Please write your Hall Ticket No. very clearly (only one digit in one block) on the OMR Answer sheet as given in your admission card. Please see that no block is left unlined and even zeros are correctly transferred to the appropriate blocks on the OMR Answer sheet. For all the subsequent purposes, your Centre Code No. and other details shall remain the same as given on the Admission Card.

2. Paper-I (Mental Ability) consists of 100 questions (Q. Nos. 1 to 100).

3. All questions carry one mark each.

4. Since all questions are compulsory, do not try to read through the whole question paper before beginning to answer it.

5. Begin with the first question and keep trying one question after another till you finish all the questions.

6. If you do not know the answer to any question, do not spend much 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 try them again.

7. Since the time allotted to the question paper is very limited, you should make the best use of the time not spending too much time on any question.

8. A blank page is provided for rough work at the end of question paper.

9. REMEMBER YOU HAVE TO SHADE ANSWERS ON A SEPARATE OMR ANSWER SHEET PROVIDED.

10. Answer to each question is to be indicated by SHADING the circle having the number of the correct alternative in the OMR Answer sheet from among the ones given for the corresponding question in the booklet.

11. Now turn to the next page and start answering the questions.

12. The OMR Answer sheet consists of two copies, the ORIGINAL COPY and the CANDIDATE'S COPY. Do not separate or displace them. Do not darken the bubbles in two copies of OMR Answer sheets separately.

After the examination, you should hand over the original copy of OMR Answer sheet to the invigilator of the room and can take away the Candidate's copy of OMR Answer Sheet with them.

13. The candidate need not return this Question Paper booklet and can take it after completion of the examination. No candidate should leave the examination hall before the end of the examination.
PAPER – I
MENTAL ABILITY TEST
(Q. Nos. 1 to 100)
Max. Marks : 100

Note : SHADE the correct alternatives in the OMR Answer Sheet provided, from amongst the ones given against the corresponding questions in the Question Booklet. For shading the circles, use a HB pencil.

Direction: In Question nos. 1 to 5:
Some letters are given in Column I and some digits are given in Column II. Each digit of Column II represents any letter of Column I. Study the columns and write the alternative letter after choosing the correct alternative against the corresponding question.

Column I  Column II
GCDIV  56372
CKDJD  95084
UDYAG  37862
DGPIOX  18994
NIOGY  06291
CROVY  25733
HGGOY  43628
UDORC  43567
DPSCC  10485
GIOHD  62960

1. The code for J is _______.
   (A) 2  (B) 0  (C) 3  (D) 4

2. The code for C is _______.
   (A) 3  (B) 6  (C) 5  (D) 2

3. The code for Y is _______.
   (A) 3  (B) 8  (C) 1  (D) 7

4. The code for D is _______.
   (A) 0  (B) 3  (C) 7  (D) 8

5. The code for G is _______.
   (A) 4  (B) 6  (C) 2  (D) 8

6. Problem Figures:
   [Diagram]
   1. (A)  (B)  (C)  (D)
   2. (A)  (B)  (C)  (D)

7. Problem Figures:
   [Diagram]
   1. (A)  (B)  (C)  (D)
   2. (A)  (B)  (C)  (D)

8. Problem Figures:
   [Diagram]
   1. (A)  (B)  (C)  (D)
   2. (A)  (B)  (C)  (D)
Direction: In Question nos. 16 to 25:
Each of the following questions consists of the five figures marked A, B, C, D and E called the problem figures followed by four alternatives marked 1, 2, 3 and 4 called the answer figures. Select a figure which will continue the same series established by the five problem figures:

16. Problem Figures:
   (A) (B) (C) (D) (E) ?
   (1) (2) (3) (4) (5)

17. Problem Figures:
   (A) (B) (C) (D) (E) ?
   (1) (2) (3) (4) (5)

18. Problem Figures:
   (A) (B) (C) (D) (E) ?
   (1) (2) (3) (4) (5)

19. Problem Figures:
   (A) (B) (C) (D) (E) ?
   (1) (2) (3) (4) (5)

20. Problem Figures:
   (A) (B) (C) (D) (E) ?
   (1) (2) (3) (4) (5)

21. Problem Figures:
   (A) (B) (C) (D) (E) ?
   (1) (2) (3) (4) (5)

22. Problem Figures:
   (A) (B) (C) (D) (E) ?
   (1) (2) (3) (4) (5)
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**Direction:** For Question nos. 26 to 30:
Same letters are given in Column I and some digits are given in Column II. Each digit of Column II represents any letter of Column I. Study the columns and write the alternative letter after eliminating the correct alternative against the corresponding question.

**Column I** | **Column II**
---|---
ALMIR | 90148
QBLRA | 63109
LNPQO | 37261
MSPTQ | 87254
RABLS | 04961
PLQST | 51437
PQAB | 79359
ARPNP | 63705
QPNAR | 63705
TSLRA | 49150

26. The code for Q is ________.
(A) 5 | (B) 4
(B) 3 | (C) 7
(C) 4 | (D) 9

27. The code for P is ________.
(A) 3 | (B) 7
(B) 4 | (C) 9

28. The code for M is ________.
(A) 8 | (B) 6
(B) 0 | (C) 1

29. The code for S is ________.
(A) 9 | (B) 3
(B) 4 | (C) 2

30. The code for B is ________.
(A) 4 | (B) 6
(B) 1 | (C) 9

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**Direction:** For Question nos. 31 to 40:
There are four terms in each question. The term to the right of the symbol : : have some relationship as the term of the left to the symbol : :: and out of the four, one term is missing, which is among one of the given four alternatives. Find the correct alternatives.

31. ________ : Play :: Sing : : Anthem
(A) Field | (B) Tutor
(C) Theater | (D) Scene

32. AEZ : EIY :: IOX : : UYZ
(A) OUW | (B) UYX
(C) AEX | (D) EIX

33. ________ : Wrist :: Belt : : Waist
(A) Arm | (B) Bend
(B) Bracelet | (C) Hand

34. Book : Chess :: Badminton
(A) Tennis | (B) Swing
(B) Grass | (C) Shuttlecock

35. Ruby : Red :: Sapphire : : ________
(A) Blue | (B) Green
(B) White | (C) Black

36. Cytology : : Geology :: Rocks
(A) Cells | (B) Psychology
(B) Cyclones | (C) Pharmacology

37. AKF : BGL :: EIO
(A) DHL | (B) PUZ
(B) SXZ | (C) DIN

38. AHT : BKH :: DMW
(A) EHF | (B) ENO
(B) CVL | (C) CVL

39. Stars : Astronomy :: History
(A) Battles | (B) Autumn
(B) Eclipse | (C) Horse

40. AYZ : EXW :: IVU
(A) TSO | (B) OST
(B) OTS | (C) SOT

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**Direction:** For Question nos. 41 to 50:
Questions have become wrong due to wrong order of signs. Choose the correct order of signs from the four alternatives given under each question, so that the equation becomes right. Write it in your answer sheet against the corresponding question number.

41. 3 + 5 - 2 = 13
(A) x = + | (B) + = +
(B) + = - | (C) - = +

42. 14 + 2 + 16 = 12
(A) x = - | (B) + = +
(B) + = + | (C) + = -

43. 5 - 6 = 11 + 19
(A) x = + | (B) = +
(B) = + | (C) + = +

44. 11 x 7 + 13 = 5
(A) x = | (B) = +
(B) = + | (C) + = +

45. 2 x 11 + 3 x 19
(A) = + | (B) x = +
(B) = + | (C) + = x

46. 12 = 3 x 19 + 4
(A) x = + | (B) + = +
(B) + = + | (C) + = +

47. 11 x 7 - 23 = 5
(A) = + | (B) = +
(B) = + | (C) + = +

48. 39 - 24 - 9 = 7
(A) = + | (B) = +
(B) = + | (C) + = +

49. 2 - 7 + 5 = 19
(A) x = | (B) + = +
(B) + = | (C) + = +

50. 7 x 5 + 16 - 19
(A) = + | (B) = +
(B) = + | (C) + = +

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Direction: In Question nos. 51 to 60:
Out of the four figures (1), (2), (3), (4) given in each question, three are similar in a certain way. Choose the figure which is different from the other figures.

51. (1) [Figure] (2) [Figure] (3) [Figure] (4) [Figure]
52. (1) [Figure] (2) [Figure] (3) [Figure] (4) [Figure]
53. (1) [Figure] (2) [Figure] (3) [Figure] (4) [Figure]
54. (1) [Figure] (2) [Figure] (3) [Figure] (4) [Figure]
55. (1) [Figure] (2) [Figure] (3) [Figure] (4) [Figure]
56. (1) [Figure] (2) [Figure] (3) [Figure] (4) [Figure]
57. (1) [Figure] (2) [Figure] (3) [Figure] (4) [Figure]
58. (1) [Figure] (2) [Figure] (3) [Figure] (4) [Figure]
59. (1) [Figure] (2) [Figure] (3) [Figure] (4) [Figure]
60. (1) [Figure] (2) [Figure] (3) [Figure] (4) [Figure]

Direction: In Question nos. 61 to 70:
In each of the following questions, a letter series is given, in which some letters are missing. The missing letters are given in the proper sequence as one of the alternatives. Find the correct alternative.

61. A__BA__AB__BA
   (1) ABBA (2) ABAB (3) BABB (4) ABA

62. ABA__BACA__BA__BACAABAC__ACA
   (1) CACB (2) CCA (3) ABCB (4) CAB

63. A_DDAAB__CC__DAA__BBB__CCDDD
   (1) BDBDA (2) BBDAC (3) BDDCA (4) DBCA

64. A_CA__BC__BCC__BAC
   (1) BABA (2) BBA (3) ABBB (4) BBAB

65. A_CBABC__CB__AB__C
   (1) ABAB (2) BACA (3) ACAB (4) CABA

66. A_BBC__AAB__CCA__BBCC
   (1) BACB (2) CCA (3) ABBA (4) CABA

67. BAA__AAB__A__ABA
   (1) ABAB (2) BABAB (3) AABBA (4) ABA

68. ABCA__BCAAB__CA__BBC__A
   (1) CCA (2) CAA (3) ABA (4) BAA

69. AA__BBA__CCAAAB__BC__C
   (1) CCB (2) BAA (3) BCC (4) AB

70. A_CC__AAB__CB
   (1) BCA (2) ABC (3) CCA (4) ABC

Direction: In Question nos. 71 to 80:
In the number series given below, one number is missing. Each series is followed by four alternatives (1), (2), (3) and (4). One of them is the right answer. Identify and indicate it as per the "Instructions".

71. 8, 24, 12, 36, 18, 54, (1) 108 (2) 27 (3) 68 (4) 72
81. Which of the following are the two married couples?
   (1) ED and CF  (2) FD and CA
   (3) FD and BA  (4) ED and BE

82. Who among the following members are the males?
   (1) B, F and D  (2) F and D
   (3) B, F and A  (4) B and F

83. Who is the sister of E?
   (1) D  (2) Data Inadequate
   (3) A  (4) C

84. Who is the husband of A?
   (1) C  (2) B
   (3) E  (4) F

85. What is A's profession?
   (1) Student  (2) Teacher
   (3) Housewife or teacher  (4) Housewife

Direction: In Question nos. 86 to 90:
Read the following information carefully and
answer the questions that follow:
There are six cities.
(i) They are A, B, C, D, E and F.
(ii) There are two married couples.
(iii) B is an engineer and the father of E.
(iv) F is the paternal grandfather of C and is a doctor.
(v) D is the paternal grandmother of E and is a housewife.
(vi) There is one engineer, one doctor, one teacher, one housewife and two students in the family.

86. Which city is a hill station and a twin city but not a historical place?
   (1) A  (2) E
   (3) D  (4) B

87. Which two cities are twin cities?
   (1) C and E  (2) B and F
   (3) B and E  (4) E and A

88. Which two cities are neither historical places nor twin cities?
   (1) B and D  (2) A and B
   (3) A and F  (4) B and E

89. Which two cities are hill stations?
   (1) A and F  (2) A and E
   (3) B and D  (4) A and D

90. Which two cities are historical places?
   (1) A and C  (2) E and D
   (3) A and D  (4) D and F

Direction: In Question nos. 91 to 100:
In these questions, numbers are placed in the figures on the basis of some rules. One place is vacant, which is indicated as "?". Find out the correct alternatives to replace the question mark (?).

91. [Diagram with numbers and question marks]
   (1) 3  (2) 8
   (3) 2  (4) 6

92. [Diagram with numbers and question marks]
   (1) 11  (2) 9
   (3) 5  (4) 8

93. [Diagram with numbers and question marks]
   (1) 15  (2) 16
   (3) 14  (4) 13

94. [Diagram with numbers and question marks]
   (1) 22  (2) 26
   (3) 28  (4) 24

95. [Diagram with numbers and question marks]
   (1) 5  (2) 8
   (3) 6  (4) 7

96. [Diagram with numbers and question marks]
   (1) 216  (2) 1944
   (3) 36  (4) 1

97. [Diagram with numbers and question marks]
   (1) 49  (2) 56
   (3) 64  (4) 96

98. [Diagram with numbers and question marks]
   (1) 47  (2) 37
   (3) 25  (4) 41
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Instructions to Candidates

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2. Paper-II (Scholastic Aptitude Test) consists of 100 questions (Q. Nos. 1 to 100).

3. All questions carry one mark each.

4. Since all questions are compulsory, do not try to read through the whole question paper before beginning to answer it.

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8. Blank pages are provided for rough work at the end of question paper.

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PAPER – II
SCHOLASTIC APTITUDE TEST
(Q. Nos. 1 to 100)
Max. Marks : 100

Note :
(i) Subjects, Total Questions of each subject and Marks allotted :-

1. Physics 13 Questions 13 Marks
2. Chemistry 13 Questions 13 Marks
3. Biology 14 Questions 14 Marks
4. Mathematics 20 Questions 20 Marks
5. History 12 Questions 12 Marks
6. Geography 12 Questions 12 Marks
7. Political Science 08 Questions 08 Marks
8. Economics 08 Questions 08 Marks

(ii) SHADE the correct alternatives in the OMR Answer Sheet provided, from amongst the ones given against the corresponding questions in the Question Booklet. For shading the circles, use a HB pencil.

POLITICAL SCIENCE

1. "... as long as there are tears and suffering, so long our work will not be over" - who spoke these words in his/her speech to the Constituent Assembly?
   (1) Mahatma Gandhi (2) Dr. B.R. Ambedkar (3) Jawaharlal Nehru (4) Sarojini Naidu

2. Which of the following States has its own Constitution?
   (1) Jammu and Kashmir (2) Nagaland (3) Gujarat (4) None of these

3. Which among the following statements is/are correct with reference to Election Commission (EC) of India?
   A. The Government Officers work under the control of the EC and not the government when they are on election duty.
   B. EC implements the code of conduct and punishes any candidate or party that violates it.
   C. The Chief Election Commissioner is not answerable to the President or the Government.
   D. The Chief Election Commissioner is appointed by the President of India.
   (1) B only (2) B, C and D (3) A, B, C and D (4) C only

4. At present, 'right to property' is a
   (1) Constitutional Right (2) Human Right (3) Fundamental Right (4) Natural Right

5. In India, the Prime Minister is
   (1) The head of the Government (2) The head of the State (3) None of these (4) The head of the State as well as Government

6. A party was recognised as a state party after general elections to the Legislative Assembly of a State. It secured six percent of the total votes. In addition to this, it must have won atleast:
   (1) three seats (2) two seats (3) four seats (4) one seat

7. Four statements are given below to support the argument "Democracy is the best form of government". Which one of them is not correct?
   (1) Democracy enhances the dignity of citizens. (2) Democracy offers better chances of a good decision.
   (3) Mistakes can never be made in democracy. (4) Democracy promotes equality among citizens.

8. When all the democracies and dictatorships for the 50 years between 1950 and 2000 are considered:
   (1) Democracies have very higher rate of economic growth
   (2) Democracies have slightly higher rate of economic growth
   (3) Dictatorships have slightly higher rate of economic growth
   (4) Both the dictatorships as well as the democracies have equal rate of economic growth
8. Consider the following statements:
A. 52 percent of the people employed in I.T and Electronics Industry are women.
B. Bangalore has emerged as the electronic capital of India.
Which of the above statements is/are NOT correct?
(1) Both A and B  (2) None of these  
(3) A only  (4) B only

10. The Godavari is known as the ‘Dakshin Ganga’ because:
(1) It is the making of waterfalls
(2) It is the biggest of all the rivers
(3) It is the longest river
(4) It is the origin in Western Ghats

11. Consider the following statements:
A. Igneous rocks are responsible for the formation of black soil.
B. Terai is a narrow belt of pebbles.
C. The newer alluvial deposits of the northern plains are called khadar.
Which of the above statements are correct?
(1) A and B  (2) A and C  
(3) B and C  (4) A, B and C

12. Consider the following countries:
A. USA  B. Egypt  C. Brazil  D. Mongolia  E. Canada  F. Uzbekistan
Which of the above countries are smaller than India with respect to area?
(1) A, B and F only  (2) C and D only  
(3) B, D and F only  (4) C and F only

13. Which of the following has recorded the highest sex ratio according to Census 2011?
(1) Kerala  (2) Delhi  
(3) Puducherry  (4) Haryana

14. Black soils are generally poor in:
(1) Calcium carbonate  (2) Phosphoric content
(3) Magnesium  (4) Potash and lime

15. Which type of forests are not found in Andhra Pradesh?
(1) Evergreen forests  (2) Mangrove forests  
(3) Deciduous forests  (4) Thorn forests

16. What were described as the “Temples of modern India” by the Prime Minister of India?
(1) Dams  (2) Hospitals  
(3) Schools  (4) Railway stations

17. Out of the following states, which one receives the “South-West monsoon” lately?
(1) Gujarat  (2) Karnataka  
(3) Maharashtra  (4) Kerala

18. Per capita consumption of which energy source is considered as an index of development?
(1) Electricity  (2) Natural gas  
(3) Petroleum  (4) Solar energy

19. Consider the following statements:
A. India is believed to be the original home of this plant.
B. It grows well in black soil.
C. China is the largest producer of it.
Which of the following crops is mentioned in all the statements given above?
(1) Sugarcane  (2) Rubber  
(3) Cotton  (4) Jute

20. The biggest port of India is:
(1) Mumbai port  (2) Kandla port  
(3) Kolkata port  (4) Paradip port

21. International Co-operative day is celebrated every year on the
(1) First Saturday of July  (2) First Saturday of August  
(3) Second Saturday of July  (4) Second Saturday of August

22. Which of the following factors is not at all related to Green Revolution?
(1) Use of HYV seeds  (2) Use of chemical fertilizers  
(3) Loss of soil fertility  (4) All of these are related

23. US farmers can sell the farm products at anomalously low prices because:
(1) They are very rich and they don’t want any profits.  
(2) They use machines for all works of cultivation.  
(3) They receive massive sums of money from the US Government.  
(4) Production cost is very low in US

24. Consider the following statements and select the correct answer using the code given below:
A. According to social scientists, social exclusion is a cause of poverty.
B. According to social scientists, social exclusion is a consequence of poverty.
(1) Only ‘A’ is correct.  (2) Only ‘B’ is correct.  
(3) Both ‘A’ and ‘B’ are correct.  (4) Both ‘A’ and ‘B’ are not correct.

25. The marginal productivity of the disguised unemployed is:
(1) Measured  (2) Very low  
(3) Very high
29. If the sum of the roots of the equation 
\((x^2 - x) = \lambda (2x - 1)\) is zero, then the value of \(\lambda\) is 
\((a) \ 1\) 
\((b) \ 2\) 
\((c) \ \frac{1}{2}\) 
\((d) \ -2\)

32. If the roots of the equation 
\((a - b) x^2 + (c - a) x + (a - b) = 0\) are equal, then 
\(\frac{a + c}{b}\) is 
\((a) \ 2\) 
\((b) \ 3\) 
\((c) \ 1\) 
\((d) \ 4\)

31. In \(\triangle ABC\), D, E and F are respectively mid points of the sides BC, CA and AB and P is a point on 
BC such that \(AP \perp BC\). If \(\angle DEF = 50^\circ\), then 
\(\angle FPD =\)
\((a) \ 135^\circ\) 
\((b) \ 110^\circ\) 
\((c) \ 120^\circ\) 
\((d) \ 130^\circ\)

33. One of the factors of 
\(x^3 - 2x^4 + 142x - 120\) is 
\((a) \ x - 1\) 
\((b) \ x + 12\) 
\((c) \ x - 4\) 
\((d) \ x + 10\)

34. The radius of a cone and cylinder are in the ratio 2 : 3 and their heights are in the ratio 3 : 2, then the value of 
\(k\) is 
\((a) \ 12\) 
\((b) \ 18\) 
\((c) \ 14\) 
\((d) \ 16\)

35. If the sum of the squares of the roots of quadratic polynomial 
\((x^2 - 8x + k) = 0\), 
then \(k =\) 
\((a) \ 12\) 
\((b) \ 18\) 
\((c) \ 14\) 
\((d) \ 16\)

38. If the equation \(a x + by + c = 0\) always pass through a fixed point whose coordinates are 
\((a) \ (-1, 2)\) 
\((b) \ (1, 2)\) 
\((c) \ (-1, -2)\) 
\((d) \ (2, -1)\)

41. If a, b, c are in A.P., then 
\(ax + by + cz = 0\) lies in 
\((a) \ Q_1\) 
\((b) \ Q_2\) 
\((c) \ Q_3\) 
\((d) \ Q_4\)

42. The volume of a regular cylindrical wire of diameter \(2\) mm is \(99\) cubic cm, then the length of wire in metres. 
\((a) \ 31.5\) 
\((b) \ 51.3\) 
\((c) \ 53.1\) 
\((d) \ 35.1\)
52. A string of negligible mass going over a clamped pulley of mass $m$ supports a block of mass $M$ as shown in the figure. The force on the pulley by the clamp is $\gamma = \text{acceleration due to gravity}$.

53. Three unequal resistors in parallel are equivalent to a resistance $1 \, \Omega$. If two of them are in the ratio of 1:2 and if no resistance value is fractional, (let them be natural numbers) the smallest of the three resistance (in ohms) is

(i) 2
(ii) 6
(iii) 4
(iv) 3

54. A small block slides without friction down an inclined plane starting from rest. Let $S_e$ be the distance travelled from time $t = (n - 1)$ to time $t = n$. Then $\frac{S_n}{S_{n+1}} = \frac{2n + 1}{2n - 1}$

(i) $\frac{2n - 1}{2n}$
(ii) $\frac{2n - 2}{2n}$
(iii) $\frac{2n + 1}{2n + 1}$
(iv) $\frac{(2n + 1)^2}{2n + 2}$

55. A ray of light is incident normally on face AB of a prism as shown in the figure. A liquid of refractive index $\mu$ is placed on the face AC of the prism. The prism is made of glass of refractive index 3/2. The limit of $\mu$ for which total internal reflection takes place on face AC is

(i) $\mu < \sqrt{3}$
(ii) $\mu < \frac{3}{14}$
(iii) $\mu < \frac{\sqrt{3}}{3}$
(iv) $\mu > \frac{\sqrt{3}}{2}$

56. Two trains with $v_x, v_y$ speeds take 3 seconds to pass one another when going in opposite direction, but takes only 2.5 seconds if the speed of any one of it is increased by (its speed) 50%. The time would take to pass the other when going in the same direction with $\sqrt{v} \text{, } v_y$ speeds in ______ sec.

(i) 10
(ii) 12
(iii) 14
(iv) 15

57. In a container (Cross-sectional Area A) a homogeneous solid cylinder of length $l$ ($l < H/2$ as shown in the figure), cross-sectional area A/5 is immersed such that it floats with its axis vertical at the liquid-liquid surface with length $l/4$ in the denser liquid as shown in the figure. The lower density liquid is open to the atmosphere. Then the density $D$ of solid is given by

(i) $\sqrt{(M - m)^2 + m^2}$
(ii) $\sqrt{(M - m)^2 - m^2}/\beta$
(iii) $\sqrt{(M + m)^2 - m^2}/\beta$
(iv) $\sqrt{(M + m)^2 + M^2}/\beta$

58. A square coil ACDE with its plane vertical is released from rest in horizontal uniform magnetic field $B$ of length $2l$. The acceleration of the coil when coming out of the field is (Acceleration due to gravity $g$)

(i) $\times \times \times \times \times \times \times \times \times$
(ii) $\times \times \times \times \times \times$
(iii) $\times \times \times \times \times \times$
(iv) $\times \times \times \times \times \times$

59. Three identical (in all aspects) metal spheres A, B and C are supported on separate insulated stands and placed in contact as shown in the figure. A charged glass rod rubbed by a silk cloth is kept near the metal sphere A, then charges on A, B and C respectively are

(i) Negative charge, Neutral, Positive charge
(ii) Positive charge, Neutral, Neutral
(iii) Negative charge, Positive charge, Neutral
(iv) Positive charge, Neutral, Negative charge

60. On a planet whose size (including radius) is the same and mass is 4 times as that of our earth. Then the amount of work done to lift 3 kg mass vertically upwards through 3 m distance on that planet is (g on the surface of earth is 10 m/s$^2$)

(i) 360 kg
(ii) 40 J
(iii) 40 kg
(iv) 360 J
50. Let the smallest audible sound (nearer to total silence) is 0 dB. A sound 1000 times more powerful than the sound nearer to total silence is
(1) 1000 dB
(2) 30 dB
(3) 10 dB
(4) 3 dB

51. The refractive index of the medium of a double convex lens is 1.5 and its focal length is 5 cm. If the radii of curvature are equal, the value of the radius of curvature is cm.
(1) 8
(2) 6.5
(3) 5
(4) 5.6

52. A block of ice at 0°C is slowly heated and converted to steam at 100°C. Which of the following curves represents the phenomenon qualitatively?

53. The national colours of France are:
(1) Green - Gold
(2) Saffron - White - Green
(3) Red - Blue - Green
(4) Blue - White - Red

54. Famous Enabling Act was passed in Germany in 1933. With this, Hitler:  
(1) restored the dignity of Germany
(2) became the dictator of Germany
(3) established socialism in Germany
(4) became the chancellor of Germany

55. Which of the following features was NOT related to Stalin?
(1) Rapid industrialization
(2) Collectivization of agriculture
(3) Annunciation of 'The New Deal'
(4) Introducing five year plans

56. In 19th century, the main destination(s) of Indian indentured migrants were:
(1) Fiji and Mauritius only
(2) Fiji only
(3) Fiji, Caribbean islands and Mauritius
(4) Fiji and Caribbean islands only

57. Who was the chairman of the Democratic Republic of Vietnam?
(1) Ngo Dinh Diem
(2) Ho Chi Minh
(3) Bao Dai

58. Consider the following statements in connection with the printing press invented by Gutenberg.
A. The first printed book was the Bible.
B. The new technology entirely displaced the existing art of producing books by hand.
C. At first, the printed books closely resembled the written manuscripts in appearance.
Which of the statements given above are correct?
(1) A and B
(2) B and C
(3) A and C
(4) A, B and C

59. The African word 'Maasai' means:
(1) My pasture
(2) My cattle
(3) My land
(4) My people

60. Which one of the following statements is correct?
(1) William-I was proclaimed King of united Italy in 1861.
(2) William-I was proclaimed German Emperor in 1871.
(3) Victor Emmanuel-II was proclaimed King of united Italy in 1871.
(4) Victor Emmanuel-II was proclaimed German Emperor in 1861.

61. Consider the following statements regarding the forest policies implemented under the British rule:
A. The first Inspector General of Forests in India was a French expert appointed by the British government.
B. Shifting agriculture in Sri Lanka was called 'Chena'.
C. The people of forest communities benefited in many ways after the forest department took control of the forests.
Which of the above statements is/are correct?
(1) A, B and C
(2) B only
(3) A and B
(4) A and C
71. Give the correct chronological order.
   A. Simon Commission
   B. First round table conference
   C. Gandhi - Irwin Pact
   D. Re-launch of Civil Disobedience Movement
   (1) D, C, A, B
   (2) A, B, C, D
   (3) C, B, A, D
   (4) A, C, B, D

72. In 1868 England was producing about 80 percent of the food it consumed. This increase
    in food-grain production was made possible mainly by:
    (1) Radical innovations in agricultural technology
    (2) Bringing new lands under cultivation
    (3) Extensive use of chemical fertilizers
    (4) The use of only bio-fertilizers

73. 'A sanyasi, who had earlier been to Fiji as an indentured labourer, led a peasant movement.
    He used to recite verses from Tulsi das Ramayana to rural audience – who was 'He' referred
    to here?
    (1) Jhinguri Singh
    (2) Jadunandan Sharma
    (3) Baba Ram Chandra
    (4) Sahajananda Saraswati

BIOLOGY

44. Name the connecting tissue that connects a muscle to the bone.
   (1) Cartilage    (2) Areolar tissue
   (3) Ligament    (4) Tendon

45. What happens to the inhaled air as it passes through the nasal cavity?
   (1) All of these
   (2) Warmed to the body temperature
   (3) Filtered in the nasal cavity
   (4) Moistened by mucus

46. Granular structures present on the rough endoplasmic reticulum are
   (1) Plastids    (2) Lysosomes
   (3) Ribosomes    (4) Lipids

47. Salivary contains an enzyme called
   (1) Pepsin    (2) Ptyalin
   (3) Lipase    (4) Trypsin

48. Which of the following is the connecting link between the aves and reptiles?
   (1) Amphibious    (2) Alligator
   (3) Dinosaurs    (4) Archaeopteryx

49. The nickname given to the neural apparatus of human digestive tract
   (1) Hind brain    (2) Second brain
   (3) Mid brain    (4) Fore brain

50. Match the item in Column-I with Column-II:
    Column-I   Column-II
    (a) Retinol   (i) Scurvy
    (b) Thiamine   (ii) Xerophthalmia
    (c) Ascorbic acid   (iii) Rickets
    (d) Calciferol   (iv) Beri-beri
   (1) a – ii, b – iii, c – iv, d – ii
   (2) a – iv, b – ii, c – iii, d – i
   (3) a – ii, b – iv, c – i, d – iii
   (4) a – iv, b – iii, c – ii, d – i

51. The process of entry of pollutants into a food chain is known as
   (1) Bio-accumulation    (2) Biomass
   (3) Bio-magnification    (4) Biosphere

52. Scientific and objective study of animal behaviour is called
   (1) Ecology    (2) Zoo geography
   (3) Ethology    (4) Zoology

53. Choose the correct statement from the below:
    Each human cell contains
   (1) only 23 pairs of autosomes
   (2) 22 pairs of autosomes and one pair of allosomes
   (3) only 23 pairs of allosomes
   (4) one pair of autosome and 22 pairs of allosomes

54. From which part of cinchona plant the alkaloid quinine is obtained?
   (1) Seeds    (2) Leaves
   (3) Bark    (4) Roots

55. Deficiency of Vasopressin causes a disease called
   (1) Goiter    (2) Asthma
   (3) Diabetes mellitus    (4) Diabetes insipidus

56. Area of best vision present in the retina
   (1) Yellow spot    (2) Blind spot
   (3) Pupil    (4) Sclera

57. Name the structure that helps the sperm in penetrating into ovum.
   (1) Acrosome    (2) Middle piece
   (3) Tail    (4) Neck
80. Find the false procedure.
(1) Roasting - Presence of oxygen - Sulphide ore - Oxide ore
(2) Froth Floatation - Presence of blown air - Impure sulphide ore - Increase concentration of sulphide ore
(3) Smelting - Presence of flux - Reduction of oxide ore - Metal
(4) Calcination - Presence of oxygen - Carbonate ore - Oxide ore

81. Potassium Super Oxide (KO₃) is used in submarines because it
(1) absorbs CO₂ and decreases O₂ concentration
(2) absorbs moisture
(3) produces ozone
(4) absorbs CO₂ and increases O₂ concentration

82. An element X belongs to 3rd period and 3rd group of the periodic table. Choose the correct statement(s) regarding it.
a. It is used in thermite process.
b. One of its allotropes is tetra atomic X₄.
c. It belongs to p-block.
d. Third most abundant element after oxygen and silicon in the earth crust.
(1) a, b and d (2) b only
(3) a and b (4) a, c and d

83. Ionic compounds are formed most easily when the combination is having
(1) High Electron Affinity, Low Ionisation Energy
(2) Low Electron Affinity, High Ionisation Energy
(3) High Electron Affinity, High Ionisation Energy
(4) Low Electron Affinity, High Ionisation Energy

84. The decreasing order of priority for choosing and naming a principal characteristic group in nomenclature is
(1) COOH > CHO > COOR >
(2) C = O > NH₂ > R - OH
(3) - COOH > - COOR > - CHO >
(4) C = O > R - OH > - NH₂

85. CuO + H₂ → Cu + H₂O is a balanced chemical equation, causing reduction of CuO. What volume of H₂ at STP is required to reduce 7.95 gm of CuO to give Cu and H₂O?
(1) 0.224 lit (2) 2.24 lit
(3) 22.4 lit (4) 2.24 lit

86. Which of the following sets of phenomena would increase on raising the temperature?
(a) Evaporation of liquid
(b) Sublimation of solid
c. Solubility of solute in water
d. Solubility of gases in water
(1) a, b (2) a, b, c
(3) a, b, c, d (4) a, c

87. Arrange the elements B, Al, Mg, K in the increasing order of metallic character.
(1) B < K < Mg < Al (2) B < Mg < K < Al
(3) B < Al < Mg < K (4) B < Mg < Al < K

88. Which of the following compound with underlined carbon is having sp³ hybridisation?
(1) CH₃ - CH₂ - CH₃
(2) CH₃ - CH₃ - CH₃
(3) CH₃ - CH₂ - NH₂
(4) CH₃ - CH₂ - CN

89. Refining of Impure Copper with Zinc Impurity is to be done by electrolysis using anode and cathode respectively as
(1) Pure Zinc, Pure Copper
(2) Pure Copper, Pure Zinc
(3) Impure Copper, Pure Copper
(4) Impure Zinc, Pure Zinc

90. Which of the following is not an oxidation reaction?
(1) Bleaching of coloured sugar cane juice/vegetables using moist sulphur dioxide.
(2) Rancidity of fats
(3) The boiling process involving the removal of impurities from a molten metal
(4) The black coating on silver due to formation of silver sulphide