NATIONAL TALENT SEARCH EXAMINATION (Stage-I), 2020-21

Paper – II

SCHOLASTIC APTITUDE TEST

NTSE-2020/21-S-II/502

SAT-2

Roll No. | | | | | | | | | | | |

NATIONAL TALENT SEARCH EXAMINATION (Stage-I), 2020-21
PAPER – I
SCHOLASTIC APTITUDE TEST

Time : 120 Minutes Full Marks : 100

For visually challenged candidate Time : 150 Minutes

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you answer the questions. **Answers are to be given on a separate O.M.R. Answer-Sheet.**

1. Please write your Roll No. very carefully (only one digit in one Box) as given on your admission card. Please see that no Box is left unfilled and even zeroes appearing in the Roll No. are correctly transferred to the appropriate Box on the booklet and on the answer sheet. For example, a student appearing from Ranchi and Roll Number 21198899999 will make entries in the boxes as under :

Roll No.	2	1	1	9	8	8	9	9	9	9	9

For all subsequent purposes your Roll No. shall remain the same as given on the admission card.

2. This Question Booklet consists of 100 multiple choice questions.

3. Each question carries one mark.

4. A blank page has been provided for rough-work at the end of the booklet.

5. Remember you have to mark your answers on a separate O.M.R. Answer-Sheet as per instruction given below.

6. Answer to each question is to be indicated by darkening the circle by **blue or black ball pen** only, the number of the most suitable alternative in the answer-sheet from amongst the ones given for the corresponding question in the test booklet. The use of pencil is not allowed.

7. O.M.R. Answer Sheet should neither be folded nor distorted. Please do not make any stray marks on the O.M.R. Answer Sheet.

8. **In case of any dispute arising out of the variation in translation, English version of the question paper will be considered as final.**

N.B. : Do not write anything except the Roll Number in the Booklet.

Physics

1. The object distance u, image distance v and focal length f for a spherical mirror are related as
   (1) $\frac{1}{v}-\frac{1}{u}=\frac{1}{f}$ (2) $\frac{1}{u}+\frac{1}{v}=\frac{1}{f}$
   (3) $v-u=f$ (4) $v+u=f$

2. The image formed by a concave mirror is observed to be virtual, erect and larger than the object. Where should be the position of the object?
   (1) Between the principal focus and the centre of curvature
   (2) At the centre of curvature
   (3) Beyond the centre of curvature
   (4) Between the pole of the mirror and its principal focus

3. The change in focal length of an eye lens is caused by the action of the
   (1) Pupil (2) Retina
   (3) Ciliary muscles (4) Iris

4. At the time of short circuit, the current in the circuit
   (1) reduces substantially (2) does not change
   (3) increases heavily (4) vary continuously

5. Three resistances of $4\Omega, 5\Omega \text{ and } 20\Omega$ are connected in parallel. Their combined resistance is
   (1) 2Ω (2) 4Ω
   (3) 5Ω (4) 29Ω

6. The electrical appliances in the houses are connected with each other in
   (1) parallel
   (2) series
   (3) a combination of series and parallel circuits
   (4) none of these

7. Electrical power is given by
   (1) $P=\frac{V}{I}$ (2) $P=\frac{I}{V}$
   (3) $P=\frac{I^2}{V}$ (4) $P=VI$

8. SI unit of magnetic field is
   (1) ampere (2) henry
   (3) tesla (4) ohm

9. The direction of induced current in a circuit is given by
   (1) Fleming's left hand rule (2) Fleming's right hand rule
   (3) Right hand thumb rule (4) Ampere's swimming rule

10. No current flows between two charged bodies when connected, if they have same
    (1) capacity (2) potential
    (3) charge (4) none of these

11. The magnetic effect of electric current was discovered by
    (1) Faraday (2) Henry
    (3) Oersted (4) Maxwell

12. The phenomen of electromagnetic induction is
(1) the process of charging a body
(2) the process of generating magnetic field due to a current passing through a coil
(3) the process of producing induced current in a coil due to relative motion between a magnet and the coil.
(4) the process of rotating a coil of an electric motor

13. The human eye forms the image of an object at its
(1) cornea (2) iris
(3) pupil (4) retina

Chemistry

14. What happens when dilute hydrochloric acid is added to iron filings?
(1) Hydrogen gas and iron chloride are produced
(2) Chlorine gas and iron hydroxide are produced
(3) No reaction takes place
(4) Iron salt and water are produced

15. In the equation
$CuO + H_2 \rightarrow Cu + H_2O$ the substance reduced is
(1) CuO (2) H_2
(3) Cu (4) none of these

16. Select the organic acid from the following :
(1) Hydrochloric acid (2) Nitric acid
(3) Sulphuric acid (4) Citric acid

17. A solution turns red litmus blue, its pH is likely to be
(1) 1 (2) 4
(3) 5 (4) 10

18. Tooth enamel contains
(1) Calcium carbonate (2) Calcium sulphate
(3) Calcium chloride (4) Calcium phosphate

19. Which one of the following compounds is not an ionic compound?
(1) Sodium chloride (2) Calcium chloride
(3) Carbon tetrachloride (4) Magnesium chloride

20. Butanone is a four-carbon compound with the functional group
(1) carboxylic acid (2) aldehyde
(3) ketone (4) alcohol

21. Ethane, with the molecular formula C_2H_6 has
(1) 6 covalent bonds (2) 7 covalent bonds
(3) 8 covalent bonds (4) 9 covalent bonds

22. Choose the metalloid from the following elements :
(1) Boron (2) Sodium
(3) Chlorine (4) Aluminium

23. Na, Mg, Al and S belong to 3rd period of the periodic table. Out of these acidic oxide is formed by
(1) Na (2) Mg
(3) Al (4) S

24. Which of the following compounds is used to repair fractured bones?
(1) Na_2CO_3 (2) $CaOCl_2$
(3) $CaSO_4, \frac{1}{2}H_2O$ (4) $CuSO_4, 5H_2O$

25. How many groups are there in modern periodic table?
(1) 7 (2) 13
(3) 18 (4) 20

26. Pure gold is
(1) 18 carat (2) 20 carat
(3) 22 carat (4) 24 carat

Biology

27. The breakdown of pyruvate to give carbon dioxide, water and energy. Takes place in presence of oxygen in
(1) Cytoplasm (2) mitochondria
(3) chloroplast (4) nucleus

28. The gap between two neurons is celled
(1) Dendrite (2) Synapse
(3) axon (4) impulse

29. Rings of cartilage are present in
(1) oesophagus (2) bile duct
(3) throat (4) small intestine

30. The xylem in plants are responsible for
(1) Transport of water (2) transport of food
(3) transport of amino acids (4) transport of oxygen

31. Which plant hormone causes bending of shoot towards light ?
(1) Auxin (2) Gibberellin
(3) Cytokinin (4) Abscisic acid

32. Which of the following plant hormones causes wilting of leaves ?
(1) Gibberellin (2) Cytokinin
(3) Auxin (4) Abscisic acid

33. Human growth hormone is produced in
(1) thyroid (2) adrenal
(3) pancreas (4) pituitary

34. Insulin is produced by
(1) Pituitary (2) Pancreas
(3) Thyroid (4) Adrenal

35. The example of unisexual flower is
(1) Hibiscus (2) Mustard
(3) Papaya (4) None of these

36. The transfer of pollen grains from anther to stigma is termed as
(1) Fertilization (2) pollination
(3) ovulation (4) double fertilization

37. Fat is digested by the enzyme
(1) amylase (2) pepsin
(3) trypsin (4) lipase

38. Genetic material is carried out by long chain of molecules made up of
(1) enzymes (2) DNA
(3) amino acids (4) proteins

39. Who proposed the law of inheritance ?
(1) Darwin (2) Mendel
(3) Lamarck (4) Morgan

40. Changes in the non – reproductive tissues caused by environmental factors
(1) Are inheritable (2) are not inheritable
(3) both (1) and (2) (4) none of these

Mathematics

41. In a mixture the ratio of milk and water is 3 : 2. If there is 5 litre milk more than water the quantity of milk in the mixture is
(1) 10 litre (2) 15 litre (3) 20 litre (4) 25 litre

42. If x = 2, y = 3 is a solution of a pair of lines 2x – 3y + a = 0 and 2x + 3y – b + 2 = 0 then
(1) a = 3b (2) a + 3b = 0 (3) 3a + b = 0 (4) 3a = b

43. In a right triangle ABC, $AB = 6\sqrt{3}$ cm, $BC = 6$ cm and $AC = 12$ cm. $\angle A$ is given by
(1) 90^o (2) 45^o (3) 30^o (4) 60^o

44. D and E are the mid-points of the sides AB and AC of ΔABC. If DE measures 3 cm, then the side BC measures
(1) 6 cm (2) 7 cm (3) 8 cm (4) 9 cm

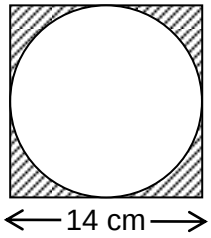
45. The mean and median of a data are respectively 20 and 22. The value of mode is
(1) 20 (2) 26 (3) 22 (4) 21

46. The tenth term from the end of the A.P. 4, 9, 14, ….. 254 is
(1) 214 (2) 209 (3) 208 (4) 204

47. Two vertices of a triangle are (3, 5) and (–4, –5). If the centroid of the triangle is (4, 3). Find the third vertex.
(1) (13, 9) (2) (9, 13) (3) (13, –9) (4) (–9, –13)

48. If tangents PA and PB from a point P to a circle with centre O are inclined to each other at an angle of 100^o, then $\angle POA$ is equal to
(1) 20^o (2) 30^o (3) 40^o (4) 50^o

49. A square is circumscribing a circle. The side of the square is 14 cm. Find the area of the square not included in the circle.



(1) 21 cm^2 (2) 42 cm^2 (3) 48 cm^2 (4) 196 cm^2

50. If the angles of elevation of the top of a tower from two points at the distances of 3m and 12m from the base of the tower in the same straight line with it are complementary, then the height of the tower (in m) is
(1) 36 (2) 60 (3) 6 (4) 100

51. The surface areas of two spheres are in the ratio 1 : 4. Then, the ratio of their volumes is
(1) 1 : 4 (2) 1 : 8 (3) 1 : 16 (4) 1 : 64

52. The slant height of a bucket is 26 cm. The diameter of upper and lower circular ends are 36 cm and 16 cm. The height of the bucket is
(1) 22 cm (2) 24 cm (3) 10 cm (4) 25 cm

53. Half of which number is 18 more than its one fifth $\left(\frac{1}{5}\text{th}\right)$?
(1) 48 (2) 52 (3) 60 (4) 64

54. Sum of two numbers is 25 and their product is 154. The greater number is
(1) 11 (2) 12 (3) 13 (4) 14

55. If A and B together can complete a work in 12 days and B and C can complete it in 15 days and C and A can complete in 20 days, then in how many days can A alone complete the said work ?
(1) 20 days (2) 30 days (3) 40 days (4) 60 days

56. The diagonals of a rhombus are 15m and 20m long. Find its area.
(1) 150 m^2 (2) 300 m^2 (3) 450 m^2 (4) None of these

57. The wall around a semicircular garden is 180 m long. The area of the garden is
(1) 1800 m^2 (2) 1900 m^2 (3) 1925 m^2 (4) 1825 m^2

58. If the measure of each interior angle of a regular polygon is 135^o, then the number of its sides is
(1) 5 (2) 6 (3) 7 (4) 8

59. The lengths of parallel sides of a trapezium are 60 m and 80 m respectively. If the distance of its parallel sides is 20 m, find the are of the trapezium.
(1) 1200 m^2 (2) 1400 m^2 (3) 1800 m^2 (4) 2400 m^2

60. Find the area of a parallelogram of which a diagonal measures 65 cm and of which two adjacent sides measure 70 cm and 75 cm respectively.
(1) 4000 cm^2 (2) 4200 cm^2 (3) 4800 cm^2 (4) None of these

History

61. Which treaty recognized Greece as an independent nation ?
(1) Treaty of Versailles (2) Treaty of Vienna
(3) Treaty of Constantinople (4) Treaty of Lausanne

62. Which of the following societies was founded by Giuseppe Mazzini ?
(1) Carbonari (2) Young Italy
(3) Young Europe (4) Jacobin Club ?

63. When did Ho Chi Minh form Vietnamese Communist Party ?
(1) 1930 (2) 1931
(3) 1932 (4) 1934

64. In which famous battle were the French defeated ?
(1) Nghe An (2) Dien Bien Phu
(3) Ha Tinh (4) Phan Boi

65. The resolution of poorna Swaraj' was adopted at which Congress session ?
(1) Karachi (2) Lucknow
(3) Lahore (4) Haripur

66. In which year did the “Great Depression” start ?
(1) 1928 (2) 1936
(3) 1929 (4) 1981

67. IMF stands for
(1) Inland Maintenance Force (2) International Military Force
(3) International Monetary Fund (4) Indian Monetary Factor

68. The first printing press was developed by
(1) Marco Polo (2) Kitagawa Utamaro
(3) Johannes Gutenberg (4) Erasmus

69. Who among the following was the leader of Dalits?
(1) Dr. B. R. Ambedkar (2) Jyotiba Phule
(3) Mahatma Gandhi (4) Sitaram Raju

70. Ravi Verma was a
(1) Painter (2) Calligraphist
(3) Scientist (4) Colonist

71. Which of the following novels was too moralising ?
(1) Chandrakanta (2) Pariksha – Guru
(3) Padmarag (4) Indulekha

72. Which European power first acquired control over Bombay ?
(1) Dutch (2) English
(3) French (4) Portuguese

73. Who among the following was known as ‘ Frontier Gandhi ’ ?
(1) Mahatma Gandhi (2) Jawaharlal Nehru
(3) Abdul gaffer Khan (4) Bhagat Singh

74. Which of the following did not take part in World war I ?
(1) England (2) Spain
(3) Germany (4) France

75. Who among the following set up the first Jute Mill in Calcutta ?
(1) Dinshaw Petit (2) J. N. Tata
(3) Set Hukumchand (4) Dwarakanath Tagore

Geography

76. What percent area of the whole country does plain occupy ?
(1) 27% (2) 43% (3) 30% (4) 50%

77. Which one of the following is the main cause of land degradation in Punjab ?
(1) Intensive cultivation (2) Over-irrigation (3) Deforestation (4) Overgrazing

78. Regions of …….. soils are intensively cultivated and densely populated.
(1) black (2) red and yellow (3) laterite (4) alluvial

79. Cropping season from November to May is called
(1) Kharif (2) Rabi (3) Zaid (4) None of these

80. “Temples of Modern India” was the name given to dams by
(1) Pt. Jawaharlal Nehru (2) Mahatma Gandhi
(3) Rabindranath Tagore (4) Subhash Chandra Bose

81. Which one of the following describes a system of agriculture where a single crop is grown on a large area ?
(1) Shifting Agriculture (2) Horticulture
(3) Plantation Agriculture (4) Intensive Agriculture

82. Limestone is found in which rocks ?
(1) Igneous (2) Sedimentary (3) Metamorphic (4) None of these

83. Which agency markets steel for the public sector plants ?
(1) HAIL (2) TATA Steel (3) SAIL (4) MNCC

84. Which one of the following countries import iron ore from India ?
(1) USA (2) Japan (3) Russia (4) China

85. Which mode of transportation reduces transshipment losses and delays ?
(1) Railways (2) Roadways (3) Pipelines (4) Waterways

86. Which movement has successfully resisted deforestation in Himalayas ?
(1) Beej Bachao Andolan
(2) Chipko Movement
(3) Navdanya
(4) Joint Forest Management

87. The habitat of Lions in India is
(1) Gir forest (2) Simlipal (3) Ranthambhor (4) None of these

88. The first Earth Summit was held at
(1) Montreal (2) Rio-de-Janeiro (3) New York (4) London

89. Which one of the following is a kharif crop?
(1) Paddy (2) Wheat (3) Watermelon (4) Gram

90. The place of India in respect of wheat cultivation is
(1) second (2) third (3) fourth (4) fifth

Civics

91. The present structure of Panchayati Raj is based on the Constitutional Amendment Act
(1) 65th (2) 73rd
(3) 74th (4) 76th

92. A person who does not discriminate others on the basis of religious beliefs, is
(1) Feminist (2) Communist
(3) Casteist (4) Secularist

93. The best form of government for promoting dignity and freedom of the individual is
(1) Democracy (2) Dictatorship
(3) Army Rule (4) None of these

94. Number of Lok Sabha Members from Jharkhand is
(1) 12 (2) 13
(3) 14 (4) 15

95. The Chairperson of a Municipal Corporation is
(1) Deputy Commissioner (2) Sarpanch
(3) Mayor (4) M.L.A. of the area

Economics

96. Which is considered to be one of the most important attributes for comparing the development of countries?
(1) Health and Education (2) Infrastructure
(3) Per capita income (4) Growth of technology

97. Which sector of the Indian Economy has grown the most over thirty years?
(1) Primary sector (2) Secondary sector
(3) Tertiary sector (4) None of these

98. Reserve Bank of India grants loans to
(1) General public (2) Private companies
(3) Commercial banks (4) All of these

99. Human Development Report is published by
(1) UNDP (2) World Bank
(3) Government of the country (4) Central bank of the country

100. In which of the following years, was Consumer Protection Act passed?
(1) 1989 (2) 1980
(3) 1985 (4) 1986