NUCLEUS EDUCATION
Centre of Excellence

NATIONAL TALENT SEARCH EXAMINATION-2019

RAJASTHAN (NTSE STAGE-I)

SCHOLASTIC APTITUDE TEST (SAT)

Time : 2 Hrs. **Max. Marks : 100**

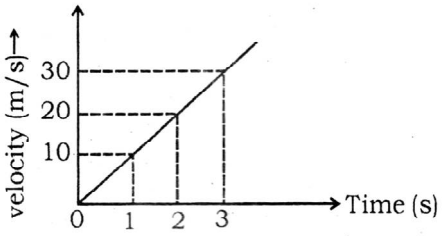
GENERAL INSTRUCTIONS :

1. The question paper contains **100** questions, **40** questions from **Science** (1-40), **20** questions from **Mathematics** (41-60), **40** questions from **Social Science** (61-100), each carries one mark.
2. Every correct answer will be awarded one mark.

SCIENCE

1. The inertia of a body depends upon
(1) gravitational acceleration (2) centre of gravity of body
(3) shape of body (4) mass of body

2. Velocity-time graph of a body moving with uniform acceleration is shown in the diagram. The distance travelled by the body in 3 seconds is



(1) 90 m (2) 45 m (3) zero (4) 10 m

3. The distance between two masses is to be halved. The gravitational force between them will be
(1) double (2) one-fourth (3) quadruple (4) half.

4. Which statement is correct among the following for gravitational acceleration (g) due to earth?
(1) The value of g is equal at poles and equatorial circle
(2) The value of g is more at poles than at equatorial circle
(3) The value of g is more at equatorial circle than at poles
(4) None of these.

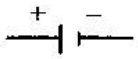
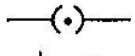
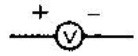
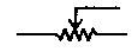
5. Which waves are used in the device "SONAR" ?
(1) Audible waves (2) Ultrasound waves (3) Infrasound waves (4) Light waves.

6. The speed of a wave is 350 m/s and wavelength is 70 cm. The frequency of wave is
(1) 500 Hz (2) 700 Hz (3) 50 Hz (4) 200 Hz

7. Which defect in human eye arises due to the irregularities in spherical shape of cornea ?
(1) Cataract (2) Hypermetropia or long sightedness
(3) Myopia or short sightedness (4) Astigmatism.

8. Focal length of a convex lens is +40 cm. The power of this lens will be
(1) + 4 dioptre (2) + 2.5 dioptre (3) + 40 dioptre (4) + 25 dioptre.

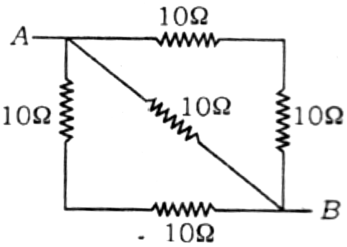
9. Match the electric devices given in **Column-A** with their symbols shown in **Column-B**.

	Column-A	**Column-B**
(a)	Voltmeter	(i) 
(b)	Rheostat	(ii) 
(c)	Electric cell	(iii) 
(d)	Plug key	(iv) 

Then correct answer is
(1) (a) - (iii), (b) - (i), (c) - (iv), (d) - (ii)
(2) (a) - (iii), (b) - (iv), (c) - (ii), (d) - (i)
(3) (a) - (iii), (b) - (ii), (c) - (i), (d) - (iv)
(4) (a) - (iii), (b) - (iv), (c) - (i) , (d) - (ii).

10. Which one of the following is not a part of Direct current generator ?
(l) Commutator (2) Sliprings (3) Armature (4) Carbon brushes.

11. The equivalent resistance of the given circuit between points A and B is



(1) 40 Ω (2) 4 Ω (3) 5 Ω (4) 0.2 Ω

12. If 4 joule work is to be done in stretching a spring by 4 cm then spring constant of the spring is
(1) $5 \times l0^3$ N/m (2) $5 \times l0^4$ N/m (3) $2 \times l0^3$ N/m (4) $2 \times l0^4$ N/m

13. The electric device which is having more use time and less electricity consumption is
(1) Incandescent Bulb (2) CFL (3) LED (4) Tubelight

14. Homogeneous mixture among the following is
(1) milk (2) cloud (3) smoke (4) air

15. The substance showing sublimation property among the following is
(1) common salt (2) copper sulphate (3) potassium nitrate (4) camphor

16. Number of molecules present in 32 g of O_2 is
(1) 6.022×10^{23} (2) 3.011×10^{23} (3) 1.51×10^{23} (4) 6.022×10^{22}

17. Number of neutrons in isotope of hydrogen, tritium is
(1) 0 (2) 1 (3) 2 (4) 3

18. The formula of chloride of an element X is XCl_3. The formula of its oxide will be
(1) XO_2 (2) XO_3 (3) X_2O_3 (4) X_3O_2

19. Molecule containing coordinate covalent bond among the following is
(1) H_2O (2) HNO_3 (3) $BaCl_2$ (4) CaO

20. Concentration of hydrogen and hydroxyl ions in mole/litre for pure water is
(1) 1×10^{-7} (2) 2×10^{-7} (3) 1×10^{-14} (4) 1×10^{-6}

21. The compound used for removal of acidity in stomach is
(1) NaCl (2) $MgCl_2$ (3) $Mg(OH)_2$ (4) $CaCl_2$

22. The chemical formula of dead burnt plaster is
(1) $CaSO_4 \cdot \frac{1}{2} H_2O$ (2) $CaSO_4 \cdot 2H_2O$ (3) $CaSO_4 \cdot H_2O$ (4) $CaSO_4$

23. Which type of catalyst is glycerol in the following reaction?

$$2H_2O_2 \xrightarrow{\text{glycerol}} 2H_2O + O_2$$

(1) Positive catalyst (2) Negative catalyst
(3) Biocatalyst (4) Autocatalyst

24. Element having largest atomic radius among the following is
(1) Li (2) Be (3) B (4) C

25. IUPAC name of isopentane is
(1) 2-ethyl propane (2) pentane (3) 2-methyl butane (4) 2,2-dimethyl propane.

26. The polymer of acrylonitrile is
(1) Polythene (2) Polyvinyl chloride (3) Polyvinyl cyanide (4) Polystyrene

27. The cell organelle discovered by de Duve is
(1) Plastid (2) Ribosome (3) Lysosome (4) Centrosome.

28. The examples of hydrophytes are
(1) Hydrilla, Calotropis (2) Lotus, Salsola
(3) Moss, Lichen (4) Segetaria, Trapa

29. Number of male gametes in the growing pollen tube is
(1) one (2) two (3) three (4) seven

30. The main method of reproduction in Yeast is
(1) Budding (2) Sporogenesis (3) Cutting (4) Grafting

31. The number of biosphere reserves established in India is
(1) 18 (2) 118 (3) 142 (4) 669

32. The bark of which plant is used as medicine?
(1) Aloe vera (2) Terminalia arjuna (3) Curcuma longa (4) Papaver somniferum

33. In which year was Indian Space Research Committee changed into Indian Space Research Organisation?
(1) 1965 (2) 1969 (3) 1975 (4) 1981

34. Bacterial disease is
(1) Dengue (2) Polio myelitis (3) Tuberculosis (4) Chicken pox

35. Honeybee culture is known as
(1) Silviculture (2) Apiculture (3) Sericulture (4) Pisciculture

36. Disease caused by deficiency of Vitamin-D is
(1) Night blindness (2) Beri-beri (3) Scurvy (4) Rickets

37. Universal donor blood group is
(1) A (2) O (3) AB (4) B

38. Skeletal muscles are
(1) striated and voluntary (2) unstriated and voluntary
(3) striated and involuntary (4) unstriated and involuntary

39. Water vascular system is found in
(1) Cnidaria (2) Echinodermata (3) Mollusca (4) Annelida

40. Which of the following is not a secondary reproductive organ?
(1) Fallopian tube (2) Uterus (3) Ovary (4) Vagina

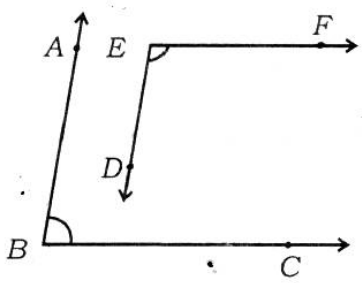
MATHEMATICS

41. Which of the following is not an irrational number?
(1) $2+\sqrt{5}$ (2) $\sqrt{2}$ (3) $\frac{7}{\sqrt{5}}$ (4) $\frac{2\sqrt{11}}{7\sqrt{11}}$

42. If a polynomial $x^4 - 4x^2 + x^3 + 2x + 1$ is divided by $x - 1$, then remainder will be
(1) 0 (2) 1 (3) 9 (4) –1

43. The sum of the digits of a two-digit number is 14. If 18 is subtracted from the number, digits are reversed. Find the number.
(1) 86 (2) 77 (3) 68 (4) 76

44. In the given figure, AB | | ED and BC | | EF, then the value of $\angle ABC + \angle DEF$ is



(1) 90° (2) 180° (3) 120° (4) 360°

45. How many cubic centimetres make 100 kilolitre?
(1) 10^{10} (2) 10^5 (3) 10^8 (4) 10^6

46. 5th term of an A.P. is 10 more than its 3rd term. What is the difference of its 9^{th} and 6^{th} terms?
(1) 15 (2) 3 (3) 6 (4) 10

47. If tan A = $\sqrt{2} - 1$ where A is an acute angle then the value of sin A . cos A will be
(1) $2\sqrt{2}$ (2) $\sqrt{2}$ (3) $\frac{1}{2\sqrt{2}}$ (4) $\frac{3}{\sqrt{2}}$

48. The multiplication of all prime numbers between 1 and 10 is
(1) 105 (2) 945 (3) 210 (4) 1890.

49. If the roots of $(b - c)x^2 + (c - a)x + (a - b) = 0$ are real and equal, then which of the following is true ?
(1) 2b = a + c (2) 2a = b + c (3) 2c = a + b (4) 2b = a – c.

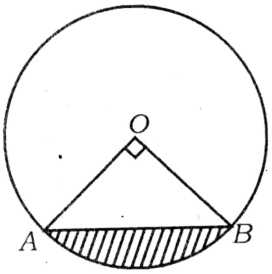
50. For which value of k, a pair of equations x + y – 4 = 0, 2x + ky – 3 = 0 has no solution?
(1) 0 (2) 2 (3) 6 (4) 8

51. The length of the side of a rhombus is 4 cm. If one of the diagonals is equal to the side of rhombus, then the length of other diagonal in cm will be
(1) $\frac{\sqrt{3}}{2}$ (2) $\sqrt{3}$ (3) $2\sqrt{3}$ (4) $4\sqrt{3}$

52. The mean of first seventeen whole numbers is
(1) 8 (2) 7.5 (3) 8.5 (4) 18

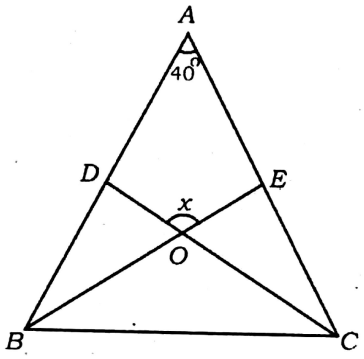
53. A cube of edge 1 cm is cut from a corner of a solid cube of edge 5 cm. What is the total surface area of the solid remained ?
(1) 150 cm^2 (2) 149 cm^2 (3) 151 cm^2 (4) 147 cm^2

54. In the given figure , chord AB subtends an angle 90° at centre O of the circle having radius 4 cm. Area of the shaded region will be



(1) $(4\pi - 2)$ cm^2 (2) $4(\pi - 2)$ cm^2 (3) $(\pi - 8)$ cm^2 (4) $(\pi - 2)$ cm^2

55. In the given figure, AB = AC, ∠BAC = 40°, BE and CD are angle bisectors of ∠B and ∠C respectively. If ∠DOE = x , the value of x is



(1) 140° (2) 70° (3) 110° (4) 40°

56. The shadow of a tower, when the angle of elevation of the sun is 30° is found to be 10 metre longer than when it was 60°. The height of the tower will be

(1) $5\sqrt{3}$ m (2) $5(\sqrt{3}-1)$ m (3) $5(\sqrt{3}+1)$ m (4) $3\sqrt{5}$ m

57. A die is thrown once. If the probability of getting a number less than 4 is x and the probability of getting a number greater than 4 is y, then x – y is

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

58. The sum of distances from x-axis and y-axis measured from the point (3, 5) will be

(1) –1 (2) 0 (3) 2 (4) 8

59. If $x^2 + 4y^2 + 9z^2 - 4xy - 12yz + 6xz = 0$, then

(1) x = 2y – 3z (2) x = y – 3z (3) 2x = y – 3z (4) x = 3y – 2z

60. Which of the following statements is false for the quadrilateral ABCD ?

(1) AB + BC + CD + DA > AC (2) AB + BC+ CD + DA > AB + AC
(3) AB + BC + CD + DA > AC + BD (4) AB+ BC+ CD + DA < 2AC.

SOCIAL SCIENCE

61. Match **List-I** with **List-II** and select the correct answer by choosing from the given code:

List-I	**List-II**
(A) Magadha	(i) Mathura
(B) Kashi	(ii) Varanasi
(C) Surasena	(iii) Taxila
(D) Gandhara	(iv) Rajgriha.

Code:

	A	B	C	D
(1)	iv	iii	ii	i
(2)	i	ii	iii	iv
(3)	iv	ii	i	iii
(4)	ii	iii	iv	i

62. In which of the following forts was the coronation of Chhatrapati Shivaji held ?
(1) Raygarh Fort (2) Kumbhalgarh Fort (3) Pune Fort (4) Surat Fort.

63. The founder of 'Abhinav Bharat' was
(1) Chandrashekhar Azad (2) Vasudev Hari Chapekar
(3) Mahatma Gandhi (4) Vinayak Damodar Savarkar.

64. Who discovered the water frame ?
(1) Henry Cort (2) Richard Archrite (3) James Bridali (4) Jethrotal.

65. When was the Quit India Movement proposal passed?
(1) 8th August, 1942 (2) 8th August, 1941
(3) 8th August, 1940 (4) 15th August, 1942.

66. The state of India, where the Kalibanga is situated, is
(1) Punjab (2) Rajasthan (3) Gujarat (4) Jammu & Kashmir.

67. Triratna is related to
(1) Buddhist philosophy (2) Vedic philosophy
(3) Islamic philosophy (4) Jain philosophy.

68. What is the modern name of Champa?
(1) Malaysia (2) Thailand (3) Vietnam (4) Indonesia.

69. Consider the following points :
(A) Raja Rammohan Roy established Vedanta College in calcutta.
(B) Swami Vivekananda wrote a book named Satyartha Prakash.
Choose the correct answer from the codes given below :
(1) Both (A) and (B) are correct
(2) Only (A) is correct
(3) Only (B) is correct
(4) Both (A) and (B) are wrong.

70. Who was the king of Russia at the time of the Russian revolution of 1917 ?
(1) Czar Nicholas First (2) Louis 14th
(3) Czar Nicholas Second (4) Louis 16th.

71. Who was the publisher of Hindu Patriot?
(1) Bal Gangadhar Tilak (2) Dayanand Saraswati
(3) Lala Lajpat Rai (4) Harishchandra Mukherjee.

72. Which one of the following rivers does not flow on the eastern coastal plain ?
(1) Krishna (2) Godavari (3) Narmada (4) Kaveri

73. The plateau between Bhainsrorgarh and Bijauliya in Rajasthan is known as
(1) Bhorat (2) Uparmaal (3) Malwa (4) Royalseema

74. Which one of the following is not a Lagoon lake ?
(1) Chilika (2) Pulicat (3) Kolleru (4) Dal

75. The duration of summer season according to Indian Meteorological Department is
(1) mid-September to mid-December (2) December to February
(3) March to mid-June (4) mid-June to mid-September.

76. In which district of Rajasthan is Amrita Devi Black Deer Sanctuary developed ?
(1) Jodhpur (2) Bikaner (3) Barmer (4) Ganganagar.

77. The joint project of Gujarat, Madhya Pradesh and Rajasthan states is
(1) Bhakhra Nangal Project (2) Mahi Bajaj Sagar Project
(3) Chambal Valley Project (4) Sardar Sarovar Project.

78. Match List-I with List-II and select the correct answer using codes given below :

List-I (District)	**List-II (Lake)**
(A) Ajmer	(i) Sardar Samand
(B) Tonk	(ii) Ana Sagar
(C) Pali	(iii) Navalakha
(D) Bundi	(iv) Tordi Sagar.

Code:

	A	**B**	**C**	**D**
(1)	(iii)	(ii)	(iv)	(i)
(2)	(ii)	(iv)	(i)	(iii)
(3)	(i)	(iii)	(ii)	(iv)
(4)	(iv)	(i)	(iii)	(ii)

79. The percentage of iron content in magnetite iron-ore is
(1) 40 - 50% (2) 50-60% (3) 60-70% (4) 70-80%.

80. Which one of the following is cement city of Rajasthan ?
(1) Chittorgarh (2) Bundi (3) Nimbahera (4) Nagaur.

81. The district having lowest population growth rate in Rajasthan during 2001-2011 is
(1) Nagaur (2) Bikaner (3) Bhilwara (4) Ganganagar.

82. 'Uni Gauge Project' by Indian Railway was started in
(1) 1982 (2) 1992 (3) 2002 (4) 2012

83. In which country is direct democracy found ?
(I) Italy (2) Japan (3) Switzerland (4) India.

84. Who has the right to promulgate an ordinance when the Parliament is not in session?
(1) Supreme Court (2) President (3) Prime Minister (4) Lok Sabha Speaker.

85. From whose pleasure does the governor hold office ?
(1) Prime Minister (2) Chief Minister (3) President (4) Vice-President.

86. What is the maximum age of retirement for judges of Supreme Court ?
(1) 62 years (2) 65 years (3) 60 years (4) 70 years.

87. The term of the President of India is
(1) 4 years (2) 5 years (3) 2 years (4) 3 years

88. On which day was the Constitution of India adopted?
(1) 15th August, 1947 (2) 9th December, 1946
(3) 26th January, 1950 (4) 26th November, 1949

89. Forced labour is prohibited in which Fundamental Right of India?
(1) Right to equality (2) Right to freedom
(3) Right against explotation (4) Right to freedom of religion

90. By which constitutional amendment Fundamental Duties are added in the Constitution of India?
(1) 42nd (2) 40th (3) 43rd (4) 45th.

91. Where is the only Cantonment Board established in Rajasthan at present?
(1) Nasirabad (2) Jaipur (3) Chittorgarh (4) Jodhpur.

92. Panchsheel is based on which philosophy ?
(1) Buddhist philosophy (2) Jain philosophy
(3) Islamic philosophy (4) Hindu philosophy.

93. Match List-I with List-II and choose the correct code from the given code :

List-I	**List-II**
(A) Nagar Nigam	(i) Zilla Pramukh
(B) Zilla Parishad	(ii) Pradhan
(C) Panchayat Samiti	(iii) Sarpanch
(D) Gram Panchayat	(iv) Mayor (Mahapoura)

Code:

	A	**B**	**C**	D
(1)	(i)	(ii)	(iii)	(iv)
(2)	(iii)	(i)	(ii)	(iv)
(3)	(iv)	(iii)	(ii)	(i)
(4)	(iv)	(i)	(ii)	(iii)

94. The nation of socialist economy is
(1) Japan (2) China (3) France (4) United States of America

95. The Kharif crop is
(1) Wheat (2) Barley (3) Maize (4) Gram.

96. The function of commercial banks is
(1) Issue of currency (2) Credit control
(3) Lender of last resort (4) Acceptance of people's deposits.

97. The formula of measuring per capita income is
(1) Per capita income = $\frac{\text{National income}}{\text{Populaiton}}$
(2) Per capita income = $\frac{\text{Population}}{\text{National income}}$
(3) Per capita income = $\frac{\text{Total consumption}}{\text{Populaiton}}$
(4) Per capita income = $\frac{\text{Population}}{\text{Total consumption}}$

98. The characteristic of Indian economy is
(1) Equality of income (2) Lack of poverty
(3) Lack of unemployement (4) Low per capita income.

99. In India the first effort to measure poverty was done by
(1) Dadabhai Naoroji (2) D.T. Lakdawala (3) Prof. Robbins (4) Prof. Keynes.

100. In India the Consumer Day is celebrated on
(1) 2nd October (2) 15th August (3) 24th December (4) 26th January.