

All India Science Teachers' Association, West Bengal
SCIENCE APTITUDE AND TALENT SEARCH TEST -2023

Time : 2 hr. 30 min.

Full Marks : 100

Class IX

INSTRUCTIONS:

1) Write your name, class, name of school and roll number both at left and right side on the answer sheet. 2) In the question paper you will find four probable answers: a), b), c) and d) against each question. Find out which one of the answers is correct or the best. There are four circles on the answer sheet corresponding to each question below a), b), c) and d). Now mark the circle below the letter of selected answer by putting a cross mark distinctly with a ball pen. If c) is the correct answer, you are to mark ○○⊗○ . 3) **1 mark will be awarded for each correct answer and 1 mark will be deducted for 3 wrong answers.** 4) Don't write anything on the question paper. Don't mark answers on the question paper. Submit the answer sheet only after the examination. 5) You may use additional blank sheet for any rough work, if necessary. 6) Do not waste time for any question which appears difficult to you, better try next question. If you consider first answer to be wrong, blacken it like ● and put ⊗ on correct answer.

1. Organic acid present in apple is
a) malic acid b) formic acid c) oxalic acid d) citric acid
2. Which one of the following animals has malpighian tubules ?
a) Toad b) Snail c) Tape worm d) Cockroach
3. Which one is connected with the left auricle of human heart ?
a) Pulmonary artery b) Pulmonary vein
c) Superior vena cava d) Renal artery
4. Factor I of blood coagulation is
a) prothrombin b) fibrinogen c) thrombin d) vit K
5. CO₂ acceptor of Calvin cycle is
a) PGA b) PGAl_d c) RuBP d) ATP

6. Which one of the following kills the microbes through phagocytosis?
 - a) Basophil
 - b) Neutrophil
 - c) Monocyte
 - d) both b and c
7. 'Break bone fever' is known as
 - a) plague
 - b) malaria
 - c) dengue
 - d) AIDS
8. Pentamer Immunoglobulin is
 - a) IgA
 - b) IgE
 - c) IgD
 - d) IgM
9. 10% Law of energy flow in ecosystem was given by
 - a) Lamarck
 - b) Odum
 - c) Lindeman
 - d) Fox
10. Two subunits of 70S ribosome are
 - a) 50S and 30S
 - b) 30S and 40S
 - c) 60S and 40S
 - d) 35S and 35S
11. Which one of the following is a trace element ?
 - a) Na
 - b) H
 - c) N
 - d) MO
12. Sugar present in RNA is
 - a) ribose
 - b) de oxyribose
 - c) lactose
 - d) maltose
13. PP factor is
 - a) Vit A
 - b) Vit C
 - c) Vit B₅
 - d) Vit B₁₂
14. MMR Vaccine is
 - a) combination vaccine
 - b) live attenuated vaccine
 - c) inactivated vaccine
 - d) toxoid
15. If humidity decreases in air then the rate of transpiration will
 - a) increase
 - b) decrease
 - c) not change
 - d) increase initially and then decrease
16. Lowest unit of classification of Living Kingdom is
 - a) phylum
 - b) genus
 - c) order
 - d) species
17. Which one of the following plants is amphibian ?
 - a) Pteridophyte
 - b) Bryophyte
 - c) Algae
 - d) Fungi
18. The term 'Hot dilute soup' was coined by
 - a) Haldane
 - b) Fox
 - c) Oparin
 - d) Odum
19. Genetic material of Protocell is
 - a) DNA
 - b) RNA
 - c) ATP
 - d) ADP

20. Coanocyte cells are present in the phylum
 a) mollusca b) annelida c) porifera d) echinodermata
21. Match the left and right column and select correct option

Left column	Right column
A. First plant having vascular tissue	i. Cartilaginous endoskeleton
B. Lasso cells	ii. Mollusca
C. Pallium membrane	iii. Ctenophora
D. Chondrichthyes	iv. Pteridophyte

- a) A-(iv), B-(iii), C-(ii), D-(i) b) A-(ii), B-(iii), C-(i), D-(iv)
 c) A-(i), B-(ii), C-(iii), D-(iv) d) A-(iii), B-(ii), C-(i), D-(iv)
22. Which one is the essential fatty acid ?
 a) Valine b) Lysine c) Leucine d) Linoleic acid
23. Reflex action is controlled by
 a) spinal cord b) liver c) pancreas d) heart
24. Amount of energy produced in aerobic respiration of 1 gm. mole glucose is
 a) 682 kcal b) 650 kcal c) 680 kcal d) 686 kcal
25. Fundus is a part of
 a) small intestine b) large intestine c) stomach d) oesophagus
26. The symbiotic bacteria that is used as biofertilizer is
 a) Azotobactor b) Clostridium c) Rhizobium d) Bacillus
27. Most harmful hepatitis virus is
 a) A b) B c) D d) E
28. Plants which grow and reproduce in low light is known as
 a) heliophytes b) sciophytes
 c) phaeophytes d) rhodophytes
29. Daphnia is
 a) zooplankton b) phytoplankton
 c) decomposer d) transformer

30. Match the left and right column and select correct option

Left column	Right column
A) Hibernation	i) Megatherms
B) High temperature	ii) Mesotherms
C) Middle temperature	iii) Poikilotherms
D) Extreme low temperature	iv) Hekistotherms

- a) A-(i), B-(ii), C-(iii), D-(iv) b) A-(iii), B-(i), C-(ii), D-(iv)
 c) A-(ii), B-(iii), C-(i), D-(iv) d) A-(iv), B-(i), C-(ii), D-(iii)

31. A quantity having only magnitude is

- a) displacement b) volume c) velocity d) momentum

32. The displacement of a particle after moving a semi circular path of radius r is

- a) $2\pi r$ b) πr c) $2r$ d) zero

33. The slope of a distance-time graph provides

- a) speed b) velocity c) acceleration d) displacement

34. If the mass of a moving body becomes 3 times, and its velocity becomes one-third, then the linear momentum of the body will be

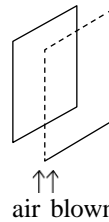
- a) 9 times b) $\frac{1}{9}$ time c) same as before d) 3 times

35. The force of gravitation between two bodies separated by some distance is F . If masses of both the bodies are doubled and distance between them is halved, then the force acting between them will be

- a) $8F$ b) F c) $16F$ d) $F/8$

36. Two pieces of paper are held vertically and air is blown between them. The papers will

- a) come closer b) go apart
 c) remain as before d) fall downward



37. The component of $5N$ force at an angle 60° is

- a) $5N$ b) $2.5N$ c) $\frac{5\sqrt{3}}{2}N$ d) 0

38. In SI system, unit of longitudinal strain is
 a) N.m b) N.m^{-2} c) no unit d) cm
39. A body weighs 200 g in air and 175 g when immersed in water. If density of water is 1.00 g/cm^3 , the volume of the body is
 a) 200 cm^3 b) 175 cm^3 c) 25 cm^3 d) 100 cm^3
40. A drop of water falling through air acquires terminal velocity after sometime. It happens as air has the property
 a) viscosity b) upward pressure
 c) flow d) surface tension
41. If acceleration due to gravity be g , a particle freely falling from rest falls in 1s through a distance
 a) $2g$ b) g c) $g/2$ d) $3g$
42. The dimensional formula of stress is
 a) $[\text{MLT}^{-2}]$ b) $[\text{MT}^{-2}]$ c) $[\text{ML}^{-1} \text{T}^{-2}]$ d) $[\text{MLT}]$
43. SI unit of energy is
 a) Joule b) Ohm c) Watt d) Newton
44. A bullet of mass 50 g emerges out from a gun with a velocity of 200 m/s. The kinetic energy of the bullet is
 a) 250 J b) 5000 J c) 500 J d) 1000 J
45. Density of pure water is highest at
 a) 0°C b) 100°C c) 4°C d) -4°C
46. To increase equal temperature of identical mass, maximum amount of heat will be required for
 a) iron b) mercury c) water d) copper
47. Mechanical vibration of a body produces
 a) light b) electricity c) sound d) magnetism
48. The phenomenon responsible for echo of sound is
 a) reflection b) refraction c) absorption d) scattering
49. The unit of intensity of sound is
 a) Joule b) Newton c) Hertz d) Bel
50. The diameter of solute particle in a true solution is
 a) $\leq 10^{-8} \text{ cm}$ b) from 10^{-7} cm to 10^{-5} cm
 c) 10^{-4} cm d) $> 10^{-4} \text{ cm}$

51. An atom without neutron is
 a) protium b) deuterium c) tritium d) helium
52. An isotope of ${}^4_2\text{He}$ is
 a) ${}^{16}_8\text{O}$ b) ${}^1_1\text{H}$ c) ${}^2_1\text{H}$ d) ${}^3_1\text{H}$
53. No. of electrons in the outer most orbit of Argon is
 a) 2 b) 6 c) 8 d) 10
54. The range of nuclear force is
 a) 10^{-12} m b) 10^{-13} m c) 10^{-10} m d) 10^{-15} m
55. Ions are formed due to the exchange of
 a) proton b) electron
 c) neutron d) both proton & neutron
56. Number of molecules in 18 g water is
 a) 6.022×10^{22} b) 60.22×10^{22}
 c) 6.022×10^{-22} d) 60.22×10^{-22}
57. 1 amu is equal to
 a) 1g b) 1.6605 g
 c) 1.6605×10^{-24} g d) 1.6605×10^{-24} kg
58. Mass of 1 gram-molecule of oxygen is
 a) 2g b) 16 g c) 32 g d) 8 g
59. Molar volume of any gas at STP is
 a) 22.4 cm^3 b) 224 cm^3 c) 22400 cm^3 d) 2.24 cm^3
60. The minimum frequency of sound audible to human ear is
 a) 40 Hz b) 50 Hz c) 20 Hz d) 200 Hz
61. A substance whose solubility decreases with increasing temperature is
 a) KNO_3 b) $\text{Pb}(\text{NO}_3)_2$ c) MgSO_4 d) $\text{Ca}(\text{OH})_2$
62. The formula of green vitriol is
 a) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ b) $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$
 c) $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ d) $\text{C}_6\text{H}_{12}\text{O}_6$
63. In an aqueous solution, an alkali produces the ion
 a) H^+ b) OH^- c) Cl^- d) H^-

64. The pH value of soap solution is
 a) 7 b) < 7, but not zero c) > 7 d) 0
65. The aqueous solution of sulphur dioxide is
 a) acidic b) alkaline c) neutral d) amphoteric
66. Antacid contains
 a) NaOH b) NaCl c) Mg(OH)₂ d) HCl
67. Fractional distillation is utilized for the separation of
 a) salt from salt solution
 b) sugar from sugar solution
 c) copper sulphate from copper sulphate solution
 d) petroleum from crude oil
68. LPG is obtained from petroleum at a temperature
 a) 30°C – 99°C b) < 30°C c) 100°C – 499°C d) > 500°C
69. Ion responsible for permanent hardness of water is
 a) Na⁺ b) K⁺ c) Ca²⁺ d) Li⁺
70. The gaseous substance liberated from bleaching powder is
 a) N₂ b) Cl₂ c) O₂ d) H₂
71. Between π and $\frac{22}{7}$ is :
 a) both rational numbers
 b) both irrational numbers
 c) π is a rational number but $\frac{22}{7}$ is an irrational number
 d) π is an irrational number and $\frac{22}{7}$ is a rational number
72. The number 0 (zero) is
 a) a whole number but not an integer
 b) a natural number but not a rational number
 c) a rational number but not a real number
 d) a whole number, a rational number but not a natural number.
73. If $(20)^{-x} = \frac{1}{7}$, then the value of $(20)^{2x}$ is
 a) $\frac{1}{49}$ b) 7 c) 49 d) 1

74. The value of $(0.243)^{0.2} \times (10)^{0.6}$ is
 a) 0.3 b) 3 c) 0.9 d) 9
75. The equation $ay + b = 0$ (a and b are constants and $a \neq 0$) represents the equation of x-axis if
 a) $b = a$ b) $b = -a$ c) $b \neq 0$ d) $b = 0$
76. 10% of 10 km is
 a) 1 m b) 1000 m c) 0.01 km d) 100 km
77. One factor of $\frac{a^4 - p^2}{49 - 81}$ is
 a) $\frac{a^2 + p}{7 + 9}$ b) $\frac{a}{7} + \frac{p}{9}$ c) $\frac{a^2 - p^2}{7 - 9}$ d) $\frac{a}{7} - \frac{p^2}{9}$
78. If the value of x in the equation $3x - \frac{2}{y} = 5$ be 3, then the corresponding value of y is
 a) $\frac{1}{5}$ b) 4 c) 2 d) $\frac{1}{7}$
79. The greatest and the smallest number among 1.5, 0.1, $\frac{4}{5}$, $(0.25)^{0.5}$ and $\left(\frac{3}{5}\right)^{0.5}$ are respectively
 a) 1.5 and 0.1 b) $(0.25)^{0.5}$ and $\left(\frac{3}{5}\right)^{0.5}$
 c) 1.5 and $\left(\frac{3}{5}\right)^{0.5}$ d) $\frac{4}{5}$ and $(0.25)^{0.5}$
80. The values of p and q for which the system of equations $px - 15y + 10 = 0$ and $2x + 6y - q = 0$ have infinite number of solutions, are
 a) $p = -5, q = -4$ b) $p = 5, q = 4$
 c) $p = -5, q = 4$ d) $p = 5, q = -4$
81. If $4^{x+2} = 2^{2x+3} + 2$, then the value of x is
 a) -1 b) 2 c) -2 d) 2
82. If $a = 3 + 2\sqrt{2}$, then the value of $\frac{a^6 + a^4 + a^2 + 1}{a^3}$ is
 a) 216 b) 204 c) 240 d) 198

83. If $\frac{5}{(3x+1)(2x+1)} = \frac{A}{3x+1} + \frac{B}{2x+1}$, then the values of A and B are respectively
- a) 15, 10 b) 1, 1 c) 3, -2 d) 15, -10
84. In a rhombus ABCD, if $\angle ACB = 40^\circ$, then the measure of $\angle ADB$ is
- a) 50° b) 110° c) 90° d) 120°
85. If the polynomial $x^3 + 6x^2 + 4x + k$ be divisible by $(x + 2)$, then the value of k is
- a) -6 b) 8 c) -8 d) -12
86. If $(x^2 - 1)$ be a factor of the polynomial $ax^4 + bx^3 + cx^2 + dx + e$, then
- a) $b + d = 0$ b) $a + b + e = 0$
c) $a + b + c = d + e$ d) $b + c + d = a + e$
87. If $x^2 - px + 12 = (x - 3)(x - a)$ be an identity, then the values of a and p are respectively
- a) -4 and 7 b) 7 and 4 c) 4 and -7 d) 4 and 7
88. In the triangle ABC, the mid points of the sides BC, CA and AB are D, E and F respectively. If BE and DF intersect at the point X and CF and DE intesect at the point Y, then the length of XY is
- a) $\frac{1}{2}BC$ b) $\frac{1}{3}BC$ c) $\frac{1}{4}BC$ d) $\frac{1}{8}BC$
89. If the profit be 20% on the selling price, then the profit on the cost price is
- a) 20% b) 25% c) 22% d) 10%
90. The 20th term of the series 2, 6, 10, 14, ... is
- a) 70 b) 76 c) 78 d) 80
91. In a frequency distribution table, the midpoint of a class is 10 and the length of each class is 6. The lower limit of this class is
- a) 6 b) 7 c) 8 d) 12

92. A parallelogram, a rectangle and a triangle stand on the same base and between the same parallels. If their areas be respectively P, R and T, then
- a) $P = R = 2T$ b) $P = R = \frac{1}{2}T$
c) $2P = R = T$ d) $P = R = T$
93. If the length of a diagonal of a square be $12\sqrt{2}$ cm, then the area of the equilateral triangle drawn on one side of the square in sq.cm. is
- a) 144 b) $36\sqrt{3}$ c) $72\sqrt{3}$ d) 108
94. If the areas of a square and a rectangle of equal perimeter be S and R respectively, then
- a) $S = R$ b) $S > R$ c) $S < \frac{1}{2}R$ d) $\frac{1}{2}R < S < R$
95. If the differences of lengths of three sides of a triangle from its semi-perimeter be respectively 8 cm, 7 cm and 5 cm, then the area of the triangle in sq.cm. is
- a) $20\sqrt{7}$ b) $10\sqrt{14}$ c) $20\sqrt{14}$ d) $10\sqrt{3}$
96. The angle between the hour hand and the minute hand at 6.42 p.m. is
- a) 45° b) 12° c) 48° d) 51°
97. If the ortho centre of the triangle ABC be O and $\angle BAC = 40^\circ$, then the measure of $\angle BOC$ is
- a) 80° b) 110° c) 140° d) 40°
98. The ratio of the areas of the circum-circle and the in circle of an equilateral triangle is
- a) 4 : 1 b) 1 : 4 c) 2 : 1 d) 1 : 2
99. If the points (0, 0), (4, -3) and (x, y) be collinear, then
- a) $x = 8, y = -6$ b) $x = 8, y = 6$
c) $x = 4, y = -6$ d) $x = -8, y = -6$
100. If $\log_2 2 \cdot \log_x 25 = \log_{10} 16 \cdot \log_e 10$, then the value of x is
- a) $2\sqrt{2}$ b) $\sqrt{2}$ c) $\sqrt{5}$ d) $2\sqrt{5}$