NEWGEN SEARCH OLYMPIAD TALENT TEST

NEWGEN SCHOLARS - THE SCIENCE OLYMPIAD

Class: 10

Name: **Time:90mins**

MATHEMATICS

I. Choose the correct answers :

1. The rational number in between $\frac{1}{2}$ and $\sqrt{1}$ is .....

   (A) $\frac{1}{2}$ (B) $\frac{3}{4}$ (C) $\frac{5}{4}$ (D) $\frac{7}{4}$

2. $\log_{10} 0.01$ = ...

   (A) -1 (B) 1 (C) -2 (D) 2

3. The value of $\frac{36}{2^3 x 5^3}$ in decimal form is .....

   (A) 0.036 (B) 0.36 (C) 0.0036 (D) 3.6

4. The symbol of " Implies" is .....

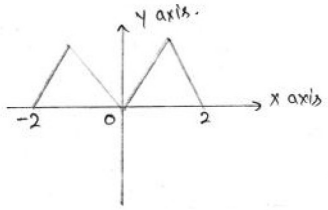
   (A) $\Leftrightarrow$ (B) $\Rightarrow$ (C) $\forall$ (D) $\exists$

5. If α β are the zeroes of polynomial $x^2 - x - 6$ then α^2 β^2 = ...

   (A) 36 (B) 6 (C) -6 (D) -36

6. The zeroes from the below graph are .....

   (A) -2
   (B) 0
   (C) 2
   (D) all



7. Degree of (x-2) (x-3) is .....

   (A) 3 (B) 2 (C) 1 (D) 7

8. 4x+6y = 18 doesn't pass through origin. It indicates a .....

   (A) Curved line (B) Straight line (C) parabola (D) None

9. The point of intersection of x+y=6 and x-y=4 is....

   (A) (5,1)(B) (1,5) (C) (2,4) (D) (4,6)

10. A pair of linear equations in two variables are 2x-y=4 and 4x-2y=6.The pair of equations are .....

    (A) Consistent (B) Dependent (C) Inconsistent (D) can not say

11. (-a, -b) $\in$ .....

    (A) Q_2 (B) Q_3 (C) Q_1 (D) Q_4

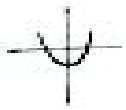
12. Two parallel lines differ by

    (A) circle (B) Triangle (C)constant (D)None

13. $\sqrt{a\sqrt{a\sqrt{a.....\alpha}}}$ = ...

    (A) $a^{1/2}$ (B) a (C)a^3 (D)a/2

14. If $b^2 < 4ac$ then shape of graphs is .....

(A) (B)  (C)  (D) 

15. The roots of $x = \frac{1}{x}$ are

(A) 2 or -2 (B) 2 or $\frac{1}{2}$ (C) 1 or -1 (D) all

16. $\sqrt{k+1} = 3$ then k = ...

(A) 24 (B) 16 (C)19 (D) None

17. 8,16,232,.....6th term is .....

(A) 256 (B) 156 (C) 108 (D) None

18. In a GP (geometric progressions). a_6 = ...

(A) ar^5 (B) a^5r (C)a^5r^5 (D) all

19. If a,b,c are in A.P. then b = ...

(A) a+c (B) $\frac{a+c}{2}$ (C) a-c (D) $\frac{a-c}{2}$

20. $1^2+2^2+3^2+.....+n^2$ = ...

(A) $\frac{n^2(n-1)^2}{2}$ (B) $\frac{n(n-1)}{2}$ (C) $\frac{n^2+1}{2}$ (D) None

21. The n^{th} term of a GP = $a_n = ar^{n-1}$, here 'r' means....

(A) Common difference (B) common ratio (C) First term (D) Radius

22. Slope of Y-axis is .....

(A) Not defined (B) 0 (C) Well defined (D) finite

23. The distance from X-axis to (-4,3) is .....units.

(A) 2 (B) 3 (C) -4 (D) -1

24. Where do the points lie on the co-ordinate axis (-4,0), (2,0), (6,0), (-8,0)....

(A) Q_1 (B) x-axis (C) y-axis (D) Q_4

25. The centroid of the triangle formed by (0,3) , (3,0) and (0,0) is ..

(A) (1,1)(B) (0,3) (C) (3,3) (D) (3,0)

26. Example for the sides of a right angled triangle is .....

(A) 5, 6, 9 (B) 5, 12, 13 (C) 5,11,12 (D) 7,8,9

27. Height of an equilateral triangle whose sides is 'a' cm is .....

(A) $\frac{\sqrt{3}}{2}a$ (B) $\frac{2}{\sqrt{3}}a^2$ (C) $\sqrt{\frac{3}{2}}a$ (D) $\frac{\sqrt{3}}{2}a^2$

28. The maximum number of possible tangents that can be drawn to a circle is

(A) Infinity (B) 2 (C) 4 (D) 1

29. The angle between the tangent and the radius drawn at the point of contact is

(A) 60° (B) 30° (C) 45° (D) 90°

30. 30. If $b^2 - 4ac < 0$ then the roots of the quadratic equation are .....

A) Distinct B) equal C) imaginary D) None

31. The total surface area of a cube is $54cm^2$ then its sides is ....cm

(A) 6 (B) 9 (C) 12 (D) 3

32. $\frac{b+c-a}{a}, \frac{c+a-b}{b}, \frac{a+b-c}{c}$ are in A.P. then $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ are in .....

A) HP B) GP C) AO D) None

33. Curved surface area of a hemisphere = ...

(A) πr^2 (B) $\frac{1}{3}\pi r^2$ (C) $3\pi r^2$ (D) $2\pi r^2$

34. Radius of a cone is 'r' height is h and its slant height is l then which of the following is false ?

(A) Always l > h (B) always l > r (C) Always r > p (D) $l^2 = r^2+h^2$

35. If α,β,χ , ar roots of a cubic polynomial then $\alpha\beta+\beta\chi+\chi\alpha$

A) $\frac{-c}{a}$ B) $\frac{c}{a}$ C) $\frac{a}{c}$ D) $\frac{1}{c}$

36. If $x = 2\sec^{-}$, $Y = 2\tan^{-}$ then x^2-y^2 = ...

(A) 0 (B) -2 (C) 4 (D) 2

37. If $\sin^{-} = \cos^{-}$ $(0<^{-}<90)$ then $\tan\frac{}{2} + \cot^{-}$ = ...

(A) $2\sqrt{3}$ (B) $\frac{}{\sqrt{3}}$ (C) 2 (D) 1

38. The maximum value of $\sin^{-}$ is

(A) $\frac{1}{2}$ (B) $\frac{\sqrt{3}}{2}$ (C) 1 (D) $\frac{1}{\sqrt{2}}$

39. $\sin^2(105°) + \cos^2(105°)$ = ...

(A) 1 (B) 0 (C)9 (D) 10

40. When the angle of elevation of a pole is 45°, the length of the pole and its shadow are.....

(A) Equal (B) Length > shadow

(C) Shadow > length (D) None of the above

41. Domain of $\sin^{-}$ = ...

(A) R (B) R- {30°} (C) N (D) None

42. Getting a tail or head .....

(A) Equally likely (B) Unlikely (C) exclusive (D) None

43. P(sure event) sure event

(A) 1 (B) 0 (C) -1 (D) =2

44. If a card is drawn from a pack the probability that it is a king is

(A) $\frac{1}{13}$ (B) $\frac{1}{52}$ (C) $\frac{1}{3}$ (D) $\frac{1}{4}$

45. If $\bar{x}$, is the mean of x_1,x_2,x_3, ...x_n.(n terms) then $\sum_{i=1}^{n}(x_1 - \bar{x})$

(A) 0 (B) $n\bar{x}$ (C) $\frac{x}{n}$ (D) $\frac{2\bar{x}}{n}$

46. In the formulae of mode, F_1 represents = ...

(A) Frequency of the modal class

(B) Frequency of class preceding modal class

(C) Frequency of class succeeding modal class

(D) CF of the class preceding the modal class

47. Mean of a+1, a+3, a+4, and a+8 is .....

(A) a+7 (B) a+4 (C) a-3 (D) None

48. .....is known as father of statistics.

(A) Cayley (B) Thales (C) Fishes (D) None

49. Mean - mode = ...

(A) 3(mean - median) (B) (mean - 2median)

(C) 2mean - median (D) None 3

50. The class mark of 10-25 is .....

(A) 10 (B) 25 (C) 17.5 (D) 17

51. Which principle states that light chooses the path which takes the least time to travel
A) Snells law B) Fermats principle C Faraday's principle D) None of these

52. What is the relation between m, hi, ho

A) $ho = \frac{-hi}{m}$ B) $ho = \frac{-m}{hi}$ C) $ho = \frac{hi}{m}$ D) $ho = \frac{m}{hi}$

53. Which of the following is lens maker's formula

A) $\frac{1}{f} = (n-1)(\frac{1}{R_1} + \frac{1}{R_2})$ B) $\frac{1}{f} = (n+1)(\frac{1}{R_1} - \frac{1}{R_2})$

C) $\frac{1}{f} = (n-1)(\frac{1}{R_1} - \frac{1}{R_2})$ D) $\frac{1}{f} = (n+1)(\frac{1}{R_1} + \frac{1}{R_2})$

54. Which of the following formula is true for plane surfaces

A) $\frac{n_2}{v} - \frac{n_1}{u} = \frac{n_2 - n_1}{R}$ B) $\frac{n_2}{v} = \frac{n_1}{u}$

C) $\frac{1}{V} + \frac{n}{R} = \frac{(n-1)}{R}$ D) $\frac{n_2}{u} - \frac{n_1}{v} = \frac{(n_1 + 1_2)}{R}$

55. If focal length value is negative what type of lens should be use
A) Concave lens B) Convex lens C) Biconvex D) Biconcave

56. During refraction, ____ will not change
A) Wave length B) Frequency C) Speed of light D) All of the above

57. What is phenomenon behind the formation of rainbow
a) Reflection B) Refraction C) Dispersion d) All of the above

58. For point of person is 5m. In order that he has normal vision what kind of spectacles should he use
A) Concave lens with focal length 5m
B) Concave lens with focal length 10 cm
C) Convex lens with focal length 5 cm
D) Convex lens with focal length 2.5 cm

59. When aluminium reacts with Iron oxide one of the end product is
A) Al_2O_3 B) Alo_4 C) Alo_2 D) Al_2o_2

60. What is the value of Avagadro number
A) 6.023×10^{23} B) 6.023×10^{24} C) 6.023×10^{22} D) 6.023×10^{21}

61. Leaves of nettle plant contains
A) Ethanoic acid B) Mthanoic acid C) Butanoic acid D) None of these

62. What gas is produced when magnesium is made to react with hydrochloric acid?
A) Hydrogen B) Oxygen C) Carbon dioxide D) No gas is produced

63. Which element is called as ekaboron
A) Scandium B) Gallium C) Gesmanium D) Silicon

64. Which of the following is most active metal
A) Lithium B) Sodium C) Potassium D) Rubidium

65. Number of elements present 5th in period of the long form of periodic table
A) 2 B) 8 C) 18 D) 32

66. Hybridization of orbitals of an atoms was introduced by minus pauling
A) Lives pouling B) Mosley C) Lewis D) Kossel

67. What is the bond angle in NH3 moleucle
A) 180^0 B) $104^0 31^1$ C) $107^0\ 48^1$ D) 120^0

68. Joule/Coulomb is the same as
A) 1 watt B) 1 volt C) 1 ampere D) ohm

69. Resistance of wire is ___ to the cross section of area
A) Directly proportional B) Inversely propotional
C) Constant D) Independent

70. The resistors of values $4\Omega, 6\Omega, 8\Omega$ are connected in series.
The equivalent resistance in the circuit is
A) 4Ω B) $14\ \Omega$ C) $16\ \Omega$ D) 18Ω

71. One Tesla =
A) Newton/coulomb B) Newton/ampere-meter
C) Ampere/meter D) Newton/ampere second

72. No force works on the conductor carrying electric current when kept
A) Parallel to magnetic field B) Perpendicular to magnetic field
C) In the magnetic field D) Away from magnetic field

73. A current carrying wire produces
A) electric field B) magnetic field
C) electromagnetic inductor D)None of these

74. Bronze is a alloy of
A) Copper and tin B) Copper, tin, iron
C) Zinc and copper D) Zinc, copper, iron

75. In which method we get more concentration of the ore.
A)Magentic separation B) washing C) smelling D) froth flotation

76. Bleaching powder is used n .....
A) oxidizing agent B) reduction agent C) antacid D) non - corrosiveness

77. The end product of ethanol is .....
A) ethanol B) Ethnic acid C) Ethene D) Ethyne

78. Saturated hydrocarbons on combustion gives ....
A) CO_2, water, heat B) CO_2, water C) O_2, water, heat D) O_2 ,water

79. A few drops f ethanoic acid were added to solid sodium carbonate . The possible results of the reaction are.
A) A hissing sound was evolved B) Brown fumes evolved
C) Bristle efflesnscene occurred D) A pungent smelling gas evolved.

80. If the object is placed between F_1 & P of a convex lens
A) Inverted, diminished & Real B) Inverted, same size & Real
C) Inverted, magnified & Real D) Erect, magnified & Virtual

81. What is pKa
A) $-\log_{10} Ka$ B)$\log_{10} Ka$ C) $-\log(H^+)$ D) $\log10[H^+]s$

82. The energy present in the light rays is
A) Neutron B) Proton C) Photon D) Projection

83. Number of canines in the mouth
A) 4 B) 6 C) 8 D) 12

84. Water and nutrients are absorbed in
A) Stomach B) Small intestive C) Large intestive D) All the above

85. Who is known as mother of genetics
A) Mendal B) Watson C) Peaplant D) Rosales

86. Sex chromosomes in female human being
A) XX B) XY C) XZ D) YY

87. In bacteria, cellular respiration occurs in
A) Cytoplasm B) Mitochondria C) Nucleus D) None of these

88. Alveoli occur in
A) Skin B) Trachea C) Gills D) Lungs

89. Respiration takes place in the presence of
A) Light B) Chlorophyll C) Optimum temperature D) Moisture

90. Heart is protected on all sides by
A) Skeleton B) Ribcage C) Pericardium D All of these

91. Transpiration in plants takes place through
A) Stem B) Root C) Both a & b D) None of these

92. These are absent in dialyzing fluids
A) Glucose B) Amino acids C) Water D) Nitrogenous wastes

93. Resin from the pinus plant is used in the manufacture of
A) Warnish B) Binding C) Rubber D) Medicines

94. The pH of soil is
A) 5 B) 6 C) 10 D) 7

95. Diabetes is related to this gland
A) Thyroid B) Pancreas C) Adrenal D) Pituitary

96. The mixed gland is
A) Pituitary B) Adrenal C Pancreas D) Ovary

97. Sporophyll of fern plant is
A) Shoot B) Root C) Leaf D) Fruit

98. The fluid secreted by accessory glands is
A) Colostrum B) Lymph C) Semen D) Carpus litem

99. The region of the world of living thing is termed as
A) Biosphere B) Ecosystem C) Food chain D) Food web

100. The consumption of coal in India is
A) 7% B) 24% C) 42% D) 2%