5. Match the followig and choose the correct one.

A (Enzyme)	B (Substrate)
(i) pepsin	(1) rice
(ii) ptyalin	(2) fish
(iii) trypsin	(3) staffrice
(iv) amylase	(4) meat

a) (i) and 3   b) (ii) and 1

c) (iv) and 4   d) (iii) and 3

6. A. statement : Phagocytosis is a function of WBC

B. Inference : Amoeba also performs this

a) A is wrong and B is right   b) A is correct but B is wrong

c) Both A and B are correct   d) Both A and B are wrong

7. Which pair of the following performs same function?

a) I_2 and Na   b) Fe and Vit A   c) Ca and Vit D

d) Zn and Vit C

8. When, in a person Antigen β is in RBC and antibody α in plasma; then his blood group will be

a) A   b) B   c) AB   c) O

9. P.P Facror is

a) enzyme   b) substrate   c) hormone   d) vitamin

10 Choose the pair same in nature.

a) Thyamin and Pyrithiamin   b) Niacin and galactoflavin

c) Pyrithiamin and galactoflavin   d) Niacin and Karotin

11. Opening of stomata occurs in the presence of

a) light   b) water   c) darkness   d) plenty of water and light

12. Rate of transpiration is measured by

a) auxanometer   b) haemocytometer   c) potometer

d) galvanometer

(2)

13. Substitute food component of glycogen is

a) fat   b) starch   c) protein   d) vitamin

14. Which of the following plant takes animal protein?

a) Pine   b) Mucor   c) Rafflesia   d) Dionia

15. Which pair of the following are symbiont?

a) Mango tree and Cuscute   b) Zoochlorella and Hydra
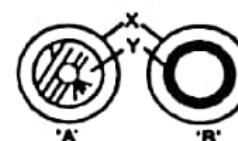
c) Oak and Yeast   d) Both b and c

16. Mismatch unit is

a) lung — alveoli   b) leaf — parenchyma

c) stomach — nephron   d) small intestine — villi

17. Locomotion of. an animal supports a scientific hypothesis, the animal is

a) earthworm   b) amoeba   c) leech   d) paramoecium

See the diagram and answer the questions (18-20)

'A'   'B'

18. Diagrams A and B represent

a) artery and vein   b) R.B.C. and W.B.C.   c) W.B.C. and platelets d) stomata and lenticel

19. 'Y' shows

a) hypodermis   b) tunicamedia   c) endodermis   d) pericycle

20. Function of 'A' and 'B' is

a) conduction of water   b) blood circulation   c) conduction of food particle   d) both a and c

21. Deoxygenated blood is purified through

a) pulmonary circulation   b) systemic circulation   c) portal circulation   d) coronary circulation

(3)

40. How much newtons is 100 kg wt?

   a) 9800   b) 980'   c) 98   d) 9.8

41. The speed of a cycle decreases most as a force is applied on it. The force makes an angle θ with the direction of the motion of the cycle. The value of θ is

   a) $270°$ b) $180°$ c) $90°$ d) $0°$

42. Most of the machines are not ideal in practical life due to frictions etc. If mechanical advantage is M and velocity ratio is V, what statement of the following is correct?

   a) $V > M$ b) $M > V$ c) $M = V$ d) output > Input

43. In a 1st class lever, the length of lever rod is 2 meter. Application of 20kgwt force in this lever overcomes 60kgwt of resistance, what is the position of fulcrum?

   a) 50cm from the point of application of the force   b) 50cm from the resistance   c) at the midpoint of the lever arm   d) 40cm from the point of application of the force.

44. An object is pulled by an external force along an inclined plane. If the angle of inclination be θ and acceleration due to gravity be g, the acceleration of the object will be

   a) g   b) more than g   c) less than g   d) zero

45. A 1.0kw motor is connected to a pump which lifts water to 15m height. If the effeciency of the system be 90% and acceleration due to gravity be 10.0 ms^{-2}, what amount of water will be lifted by the pump in one second?

   a) 20kg   b) 50kg   c) 10kg   d) 6kg

46. Light ray of yellow, red, violet and blue colours are incident on water level at rest with equal angle of incidence. For what colour of light will the angle of refraction be minimum?
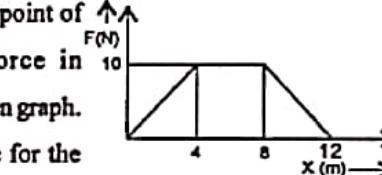
   a) Yellow   b) Red   c) Violet   d) Blue

(6)

47. If velocity of light in vacuum be $3 \times 10^8 ms^{-1}$ and refractive index of glass be 1.5, the velocity of light in the glass will be

   a) $3 \times 10^8 ms^{-1}$ b) $2 \times 10^8 ms^{-1}$ c) $4.5 \times 10^8 ms^{-1}$ d) $2 \times 10^9 ms^{-1}$

48. The quality of two notes are different due to

   a) difference of intensities   b) difference of frequencies   c) presence of separate overtones   d) any other cause

49. An object moves half the distance of definite path with the velocity of 15ms^{-1} and the second half of the path with the velocity of 25ms^{-1}. What is the average velocity of the object?

   a) 20ms^{-1} b) 10ms^{-1} c) 18.75ms^{-1} d) 19.25ms^{-1}

50. An applied force (F) on an object of mass.1kg changes with the displacement (x) of the point of application of the force in consistence with the given graph. Work done by the force for the displacement $x = 0$ to $x = 4$ and $x = 4$ to $x = 12$ are respectively

   a) 20J, 40J   b) 40J, 40J   c) 40J, 80J   d) 20J, 80J

51. Which substance in the gaseous state has smell of fish?

   a) Acetylene   b) Ozone   c) Hydrogen sulphide   d) Chlorine

52. Which of the following substances has maximum melting point at normal pressure?

   a) Sulphur   b) Lead   c) Silver   d) Zinc

53. Which one of the following reaction is exothermic?

   a) $C + O_2 \rightarrow CO_2$ b) $N_2 + O_2 \rightarrow 2NO$
   c) $N_2 + 3H_2 \rightarrow 2NH_3$ d) $2SO_2 + O_2 \rightarrow 2SO_3$

(7)

54. The colour of the ammoniacal cuprous chloride solution, when O_2 is passed through it becomes

a) blue   b) brown   c) red   d) yellow

55. Oxide of the which element in the following is not basic?

a) Hg   b) Bi   c) As   d) Ag

56. A chemical compound 'A' is used is softening temporary hardness of water. A reacts with Na_2CO_3 solution to produce caustic soda. In this solution red litmus becomes blue. The chemical formula of 'A' is

a) $Ca(OH)_2$ b) CaO c) $Ca(HCO_3)_2$ d) $CaCO_3$

57. Which one of the following substances does not produce ammonia on treatment with water?

A) $CaCN_2$ b) $Ca(CN)_2$ c) Mg_3N_2 d) AlN

58. Which nitrogen oxide of the following produces both sodium nitrate and sodium nitrite on treatment with sodium hydroxide solution?

a) NO_2 b) N_2O_5 c) N_2O_3 d) NO

59. A bottle containing liquid ammonia is cooled keeping in ice before opening its cork. Because, liquid ammonia

a) is harmful to eyes   b) has high vapour pressure

c) is a corrossive substance   d) is a weak explosive

60. The chemical name of K_2CS_3 is potassium

a) thiocyanate   b) sulphocyanamide   c) thiocarbonate

d) thiocarbide

61. The main constituent of liquified petroleum gas is

a) methane   b) ethylene   c) butane   d) chlorine

(8)

62. Carbon—60 contains in its structure

a) 30 pentagons and 30 hexagons   b) 12 pentagons and 20 hexagons   c) 20 pentagons and 12 hexagons   d) 24 pentagons and 16 hexagons

63. LPG gas cylinder is used in cooking etc. purposes. In any case there are leaks in burner, rubber tube or cylinder, a gas with bad smell comes out to alert users. It is due to premixing of a certain gas with LPG. It is

a) sulphur di-oxide   b) ethyl mercaptan   c) butane

d) hydrogen sulphide

64. On combustion with O_2 fullerene dissolved in benzene in presence of U-V light produces

a) CO_2 b) CO   c) C_3O_2 d) fullerene epoxide

65. The chemical name of Zeolite used to remove hardness of water is

a) permutit   b) sodium alumino silicate   c) sodium stearate

d) sodium alumino sulphate

66. If fluoride concentration is more in water then there is corrosion of teeth and bone. The maximum permissible concentration of fluoride in one litre of water is

a) 1.8mg   b) 1.5mg   c) 4mg   d) 0.5mg

67. Which of the following metallic elements produces hydrogen on reaction with both the acids and alkalis?

a) Li   b) Mg   c) Ca   d) Be

68. A substance whose solubility decreases with increase of temperature is

a) KNO_3 b) NaCl   c) $Ca(OH)_2$ d) $NaNo_2$

(9)

85. If $\frac{1}{x}+\frac{1}{2}=\frac{1}{3}$, the value of x is

    a) 0   b) –1   c) –4   d) –6

86. If $\left(a+\frac{1}{a}\right)^2=3$, the value of $a^3+\frac{1}{a^3}$

    a) –4   b) –2   c) 0   d) 2

87. If $\frac{a}{b}+\frac{b}{a}=1$, the value of a^3+b^3

    a) –4   b) –2   c) 3   d) 0

88. For what value of t, the expression $25x^2 - 20x + t$ will be a perfect square?

    a) 1   b) 2   c) 3   d) 4

89. If $a^3 + b^3 = m$ and $a + b = n$, then the value of mn is

    a) $\frac{n^3-m}{3n}$ b) $\frac{m^3-n}{3m}$ c) $\frac{m^2-n^2}{mn}$ d) $\frac{mn}{m+n}$

90. If $p+\frac{1}{p}=1$, the value of $\frac{2}{p^3-p-1}$ is

    a) –1   b) 0   c) +1   d) 2

91. In a parallogram ABCD, $\angle A = 75°$, the value of $\angle B$ is

    a) 75°   b) 90°   c) 105°   d) 180°

92. In a rhombus ABCD, the length of the side AB is 4cm and $\angle BCD = 60°$. Length of the diagonal BD is

    a) 7cm   b) 5cm   c) 4cm   d) 2cm

93. The magnitude of the complementary angle of which angle is equal to $\frac{1}{4}$ of the supplementary angle of that angle?

    a) 30°   b) 40°   c) 50°   d) 60°

94. The three medians of a triangle meet at a point. The name of the point is

    a) circum centre   b) ortho centre   c) in centre   d) centroid

(12)

95. The diagonals AC & BD of a rhombus ABCD intersecti at O. If $\angle ACD = 60°$, the value of $\angle ODC$ is equal to

    a) 30°   b) 45°   c) 60°   d) 90°

96. BE & CD are two mediams of the triangle ABC. If the area of $\triangle ACD$ be 30 sqcm, the area of $\triangle BCE$ is

    a) 20 sqcm   b) 30 sqcm   c) 35 sqcm   d) 45 sqcm

97. The side BC of the triangle ABC is produced to D. If $\angle ACD = 140°$ & $\angle ABC = 3\angle BAC$, the value of $\angle ABC$ is

    a) 90°   b) 100°   c) 105°   d) 120°

98. The length of a diagonal of a rhombus is twice that of the other. If the area of the rhombus is 64 sqcm, the lengths of the two diagonals are

    a) 30cm, 60cm   b) 4cm, 8cm   c) 16cm, 32cm   d) 8cm, 16cm

99. The monthly income of a man is Rs. 5200 and monthly expenditure is Rs. 4550. What percent of his income does he save?

    a) 10%   b) $12\frac{1}{2}$%   c) 20%   d) 25%

100. A wire can be bent into a circle of diameter 84cm. What will be the length of one side, if it is bent into a square.

    a) 30cm   b) 40cm   c) 55cm   d) 66cm

(13)

69. The percentage of sodium in washing soda ($Na_2CO_3 \cdot 10H_2O$),

   [Na = 23] is

   a) 16.08 b) 31.5 c) 62.1 d) 46

70. Which of the following indicators produces reddish-violet colour

   in the aqueous solution of ammonia?

   a) Litmus b) Phenolphthalein c) Methyl orange

   d) Methyl red.

71. A man spends his three month's income in four months.

   What is his annual saving if his monthly income is Rs. 1000.

   a) Rs. 2000 b) Rs. 3000 c) Rs. 4000 d) Rs. 5000

72. Average of five numbers is 6 and the average of three numbers

   is 5. What is the average of the other two?

   a) 6.5 b) 7 c) 7.5 d) 8

73. Total age of 12 boys is 90 years. After 6 months their average

   age will be—

   a) 8 years b) $8\frac{1}{2}$ yrs c) $10\frac{1}{2}$ yrs d) 12 yrs

74. A boy wrote 54 instead of 45 by mistake. As a result he got the

   average of 5 numbers as 52. Correct average of the numbers is

   a) 40 b) 50.1 c) 50.2 d) 60

75. The ratio of ages of A, B and C is 5 : 8 : 9. If the sum of the ages

   of A and C is 56 years, the age of B is

   a) 30 yrs b) 32 yrs c) 40 yrs d) 42 yrs

76. The time taken by the hour hand of a clock to rotate through 45° is

   a) 1 hr b) $1\frac{1}{2}$ hr c) 3 hr d) 6 hr

(10)

77. A train 144m long crosses a bridge 256m long in 24 sec.

   The speed of the trains is

   a) 40km/hr b) 50km/hr c) 60km/hr d) 100km/hr

78. Working 7 hours a day a man can make 500 spare parts in 4

   days. In 7 days working 6 hours a day he can make the

   number of spare parts

   a) 500 b) 650 c) 750 d) 900

79. 25% of what amount of money is equal to $12\frac{1}{2}$% of Rs. 180?

   a) Rs. 75 b) Rs. 80 c) Rs. 90 d) Rs. 100

80. If 50% of (P + 2Q) = 30% of (2P + 3Q), then the correct relation is

   a) P = Q b) P = 2Q c) 2P = 3Q d) 2P = Q

81. Of the two numbers if the 1st be increased by 15% and the 2nd

   be decreased by 10%, the two numbers become equal. What

   is the ratio of the 1st number to the 2nd number?

   a) 15 : 17 b) 10 : 15 c) 18 : 23 d) 25 : 26

82. 60% out of 150 examinees passed in an examination. How many

   more examinees should have passed in that examination so that

   the percentage of passing would be 70%

   a) 15 b) 20 c) 25 d) 30

83. At what rate percent of S. I. per annum, the interest on a cer-

   tain sum of money for 10 years will be $\frac{2}{5}$ part of the amount?

   a) $5\frac{1}{2}$% b) 6% c) $6\frac{2}{3}$% d) $8\frac{1}{2}$%

84. In how many years will a sum of money will double itself at

   $6\frac{1}{4}$% S. I. per annum?

   a) 16 yrs b) 18 yrs c) 20 yrs d) 25 yrs

(11)

22. Rh factor is present in the
    a) plasmamembrane of human RBC
    b) plasmamembrane of Rhesus monkey's RBC
    c) plasmamembrane of human WBC
    d) both a and b

23. Which of the following resembles 'Lock and Key' function?
    a) Function of stomach   b) Function of artery   c) Function of enzyme   d) Function of xylem

24. Hormone regulated movement is
    a) tactic   b) nastic   c) heliotropic   d) hydrotropic

25. Which two cycles are interdependent in atmosphere?
    a) N_2 and O_2 b) O_2 and CO_2 c) CO_2 and N_2 d) water and phosphorus

26. Which protein is not a component of plasma of human blood?
    a) Albumin   b) Lecithin   c) Fibronogen   d) Prothrombin

27. Humidity of atmosphere is related with the physiological process called
    a) photosynthesi b) transpiration c) respiration d) conduction

28. During diastolic condition blood flows through
    a) whole body→deoxygenated blood→venacava→right auricle
    b) lung→oxygenated blood→pulmonary vein→left auricle
    c) right ventricle→deoxygenated blood→pulmonery vein→lung
    d) both a and b

29. Denitrification is conversion of
    a) $NO_3 \to N_2$ b) $NH_3 \to NO_3$ c) $NH_3 \to N_2$ d) $NH_3 \to NO_2$

30. Which of the following does not pollute our atmosphere?
    a) Amonium sulphate b) Phosphate c) DDT d) Green manure.

(4)

31. In the international unit system 'steradian' is considered to be fundamental unit of the physical quantity called
    a) illuminance   b) central angel of an arc
    c) absolute temperature   d) solid angle

32. Volume of 1kg of pure water at 277K temperature is called one
    a) litre   b) cubic centemetre   c) gallon   d) ounce

33. Dimentional equation of pressure is P =
    a) $ML^{-1}T^{-2}$ b) MLT^{-2} c) $M^{-1}LT^{-1}$ d) $ML^{-2}T^{-2}$

34. If 1. kerosene oil 2. olive oil 3. water and 4. milk, the correct ascending order of densities of the above substances at room temperature is
    a) 1 2 3 4   b) 4 3 2 1   c) 2 1 3 4   d) 3 2 1 4

35. The weight of an object is maximum at
    a) north pole   b) equatorial region   c) mines   d) moon

36. The surface is not concave for which of the following liquid at 20°C?
    a) Water   b) Chloroform   c) Alcohol   d) Mercury

37. Which of the following substance has fixed freezing point and melting point ?
    a) Butter   b) Glass   c) Ice   d) Wax

38. 3 kg of ice (m.pt 273K) is mixed with 1 kg of common salt (m.pt 1074K). The melting point of this mixture will be
    a) 253K   b) 273K   c) 1074K   d) 673.5K

39. A man of mass 60kg moves 0.5 km path with a box of mass 30 kg on a horizontal plane. The amount of work done in the process is
    a) 90J   b) 45J   c) 22.5 J   d) Zero

(5)

All India Science Teachers' Association, West Bengal
SCIENCE APTITUDE AND TALENT SEARCH TEST–2014

Time – 2hr. 30min.   Full marks – 100

Class - IX

INSTRUCTION :

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 your probable answers : a), b), c) and d) against each question. Find out which of the answers appears to you to be correct or the best. There are four circles on the answer sheet corresponding to each question no. a), b), c) and d). Now mark the circle below the letter of the selected answer in the answer sheet by putting a cross mark distinctly with a ball pen as shown here O O ⊗ O, here c) is the correct answer. 3) 1 mark will be awarded for each correct answer and 1 mark will be deducted for 3 wrong answers. Don't write anything on the question paper. 4) Don't underline or tick the answer 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 answering a question which appears difficult to you, better try next question. If you consider first answer wrong, blacken it like ● and put ⊗ on correct answer.

1. Which digestive juice of human body turns the colour of litmus paper from blue to red?

   a) Saliva   b) Pancreatic juice   c) Bile juice   d) Gastric juice

2. Choose the odd in the following character

   a) Lactic acid   b) Nitric acid   c) Ascorbic acid   d) Pyruvic acid

3. Centre of respiration in a human body is present in that part of nervours system called

   a) cerebrum   b) cerebellum   c) pons

   d) apical part of spinal cord

4. The respiratory organ directly conducts O_2 is

   a) lung   b) trachea   c) gill   d) both a and b