FIITJEE

SCHOLASTIC APTITUDE TEST – 2017

Time: 90 Minutes   **Maximum Marks: 100**

Please read the instructions carefully.

INSTRUCTIONS

Instructions to the Candidates

Read the following instructions carefully before you answer the question:

1. Answer are to be given on a **SEPARATE ANSWER SHEET**.
2. Please write your **eleven digits Roll Number** very clearly on the Test-Booklet and **Answer Sheet** as given in your admission card.
3. Please note **and follow the instructions** given on the answer sheet for writing the answers.
4. **Darken the CIRCLE with pen for answering** the question in the appropriate space against the number corresponding to the questions you are answering.
5. There are 50 questions in the test.
6. Since **all questions are compulsory**, do not try read the whole question paper before beginning to answer it.
7. If you do not know the answer to any question, do not spend much time on it and pass on to the next one. Time permitting, you can come back to the question, which you left in the first instance and try them again.
8. Since the time allotted for this question paper is very limited you should make the best use of it by not spending too much time on any one question.
9. **Rough work** can be done **anywhere in the booklet** but not on the answer sheet/loose paper.
10. Every correct answer will be awarded one mark.
11. **Please return the answer sheet to the invigilator after the test.**

Enrollment No. : ☐☐☐☐ ☐☐ ☐☐☐ ☐☐   Batch : _____

Name : _____

Candidate's Signature _____   Invigilator's Signature: _____

BIOLOGY

1. This diagram shows that process of

    (A) Binary Fission   (B) Multiple fission
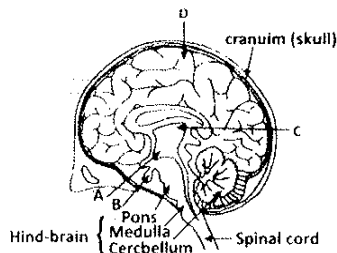   (C) Regeneration   (D) Budding

2. The gene which control the blood group represented by the letter
    (A) B   (B) E
    (C) I   (D) O

3. Person who are infected with …… can donate eyes.
    (A) AIDS   (B) Diabetes
    (C) Hepatitis B or C   (D) Rabies

4. Which part of brain shows pituitary gland?

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

5. The hormone which promote cell division in plants is ……….
    (A) Gibberellins   (B) Abscisic acid
    (D) Cytokinins   (D) Auxins

6. Which one of the following is a type of nutrition in Amoeba?
    (A) Holozoic   (B) Autotrophic
    (C) Parasitic   (D) Saprophytic

7. ………transports products of photosynthesis from the leaves where they are synthesized to other parts of the plant.
    (A) Xylem   (B) lymph
    (C) nephrons   (D) phloem

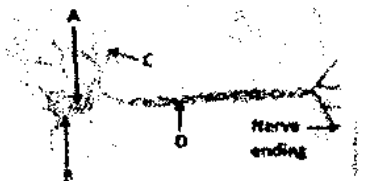8. Which of the following is a biotic components of an ecosystem?
    (A) Living organisms   (B) Temperature
    (C) Soil and minerals   (D) All of the above

9. ……….. is a dark muscular diaphragm that controls the size of the pupil.
    (A) cornea   (B) retina
    (C) Iris   (D) Crystalline lens

10. Which part of neuron shows dendrite?

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

11. Which part of the cell is also termed as 'suicide bags of the cell'?
    (A) Ribosomes   (B) Golgi bodies
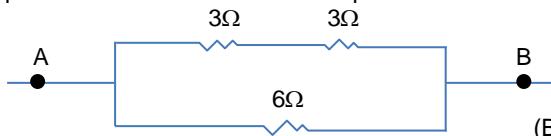   (C) Lysosomes   (D) Mitochondria

12. Which tissue of the following connects bone and muscle?
     (A) Ligament   (B) Cartilage
     (C) Areolar Tissue   (D) Tendon

13. Which of the following is correct order for classification of animals.
     (A) Kingdom, phylum, Class, Order, Family, Genus, Species
     (B) Kingdom, Phylum, Order, Class, Genus, Family, species
     (C) Kingdom, Class, Order, Phylum, Genus, Family, Species
     (D) Kingdom, Class, Genus, Phylum, Family, Order Species

14. What factors could lead to the rise of new species?
     (A) Natural Selection   (B) Genetic drift
     (C) Acquisition of traits during life time   (D) All of above

CHEMISTRY

15. White silver chloride turns …………..in sunlight.
     $2AgCl(s) \xrightarrow{Su-nli-gh-t} 2Ag(s) + Cl_2(g)$
     (A) Grey   (B) Brown
     (C) Blue   (D) Green

16. Which one of the following is not an organic acid?
     (A) Citric acid   (B) Formic acid
     (C) Carbonic acid   (D) Carboxylic acid

17. What type of reaction is this?
     $MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$
     (A) Redox reaction   (B) Displacement reaction
     (C) Double displacement reaction   (D) Decomposition reaction

18. The atmosphere of Venus is made up of thick white and yellowish could of ………….
     (A) Acetic acid   (B) Sulphuric acid
     (C) Nitric acid   (D) Hydrochloric acid

19. Aqua regia is a highly corrosive, fuming liquid. It is one of the few reagents that is able to dissolve ……………..
     (A) Platinum   (B) Gold
     (C) Both A and B   (D) Neither A or B

20. …….. is a non-metal but it is lustrous.
     (A) Carbon   (B) Sulphur
     (C) Bromine   (D) Iodine

21. _____ plants are one of the most efficient convertors of sunlight into chemical energy.
     (A) Jatropha   (B) Sugarcane
     (C) Cotton   (D) Sunflower

22. The head of a soap molecule is known as _____
     (A) Hydrocarbon   (B) Hydrophobic
     (C) Hydrogen Carbonate   (D) Hydrophilic

23. Esters are formed by the combination of
     (A) Alcohol + Aldehyde   (B) Carboxylic Acid + Alcohol
     (C) Carboxylic Acid + Aldehyde   (D) Alcohol + Aldehye

24. ………Was the element which was discovered later and replaced Exaaluminum.
     (A) Scandium   (B) Gallium
     (C) Germanium   (D) Silicon

25. An isotope of ……… is used in the treatment of cancer.
     (A) Cobalt   (B) Iodine
     (C) Uranium   (D) Chlorine

26. Face cream is an example of _____
     (A) Aerosol   (B) Emulsion
     (C) Foam   (D) Gel

PHYSICS

27. For spherical mirrors of small apertures, the radius of curvature is found to be ……………
    (A) equal the focal length.
    (B) twice the focal length
    (C) thrice the focal length.
    (D) there is no relation between them.

28. A convex mirror used for rear-view on an automobile has a radius of curvature of 3.00 m. If a bus is located at 5.00 m from this mirror, find the size of the image.
    (A) 0.32 m
    (B) 0.23 m
    (C) 0.87 m
    (D) 1.15 m

29. The net power (P) of three lenses having powers P1 , P2 and P3 placed in contact is given by
    (A) P = P1 x P2 x P3
    (B) P = P1 + P2 + P3
    (C) 1/P = 1/ P1 + 1 /P2 + 1/P3
    (D) P = (P1 + P2 + P3)/3

30. Two wires that are made up of two different materials whose specific resistance are in the ratio 2 :3 , length in ratio 3: 4 and area in 4 : 5. The ratio of their resistance is
    (A) 6 : 5
    (B) 6 : 8
    (C) 5 : 8
    (D) 1 : 2

31. The equivalent resistance between the points A and B in the circuit as shown in the figure below is

    (A) 3
    (B) 13
    (C) 6
    (D) 1/3

32. What is the unit of resistivity
    (A) Ωm^2
    (B) Ωm^{-1}
    (C) Ωm^{-2}
    (D) Ωm

33. 100 J of heat are produced each second in a 4 Ω resistance. Find the potential difference across the resistor
    (A) 400 V
    (B) 10 V
    (C) 20 V
    (D) 25 V

34. Two bulbs are marked 100W, 220V and 50W, 110 V. Calculate the ratio of their resistances.
    (A) 2 : 1
    (B) 1 : 2
    (C) 3 : 4
    (D) 1 : 3

35. An induced current is produced when a magnet is moved into a coil. The magnitude of induced current does not depend on
    (A) The speed with which the magnet is moved
    (B) The resistivity of the wire of the coil
    (C) The number of turns of the coil
    (D) The strength of the magnet

CHEMISTRY

36. A Strong smelling substance called ethyl mercaptane which is added to LPG cylinders to help in the detection of gas leakage has the chemical formula as
    (A) C_2H_5SH
    (B) C_2H_5CHO
    (C) C_2H_5OH
    (D) C_2H_5COOH

37. The aviation fuel which is used in the engine of jet aeroplanes is very close to
    (A) Diesel
    (B) Natural Gas
    (C) Petrol
    (D) Kerosene

PHYSICS

38. The unit of solar constant is
    (A) kWh
    (B) kW/m
    (C) kW/m^2
    (D) kW/m^3

39. The flaws like internal cracks etc. in the metal blocks are detected by using_____
    (A) Reverberation
    (B) Ultrasound
    (C) Infrasound
    (D) Echo location

40.   A person standing at a certain distance from a wall produces a loud sound. He hears the echo of the sound after 1.8s Calculate the distance between the wall and the observer if the velocity of sound in air is 340 m/s.
       (A) 612m   (B)   306 m
   (C) 377.7m   (D) 755.4m

SST

41.   Arrange the fowling states in ascending order of population densely.
       I. Assam   II. Nagaland
       III. Tripura   IV. Mizoram
       (A) I, II, III, IV,   (B) II, III, IV, I
       (C) IV, II, III, I,   (D) IV, I, II, III,

42.   Match list I Animals/ Plants with list II category of existence and select the answer using the codes given below.
       List 1 (Animlas/plants list II (Category of existence)
       I.   Black buck   A.   Extinct
       II.   Asiatic elephant   B.   Rare
       III. Andaman Pig   C.   Endangered
       IV.   Himalyayan brown bear   D.   Vulnerable
       V.   Pink head duck   E.   Endemic
       (A) I – B, II –C, III –A, IV –D, V – E   (B) I – C, II –B, III –D, IV –E, V – A
       (C) I – C, II –D, III –E, IV –b, V – A   (D) I – E, II –D, III –B, IV –A, V – B

43.   Find out-the incorrect statement with respect to Black soil.
       (A) Black soil is well known for its capacity to hold moisture.
       (B) Black soil is rich in phosphoric content
       (C)   Black soil is sticky when wet and difficult to work
       (D) Deep crack in black soil helps in the proper aeration of the soil

44.   Which type of drainage patterns is formed when the river channel follows the slope of the terrain?
       (A) Radial   (B) Rectangular
       (C) Trellis   (D) Dendritic

45.   Contour liner represent _____.
       (A) Areas recording same amount of rainfall.   (B) Areas having same degree of temperature
       (C) Areas having same height above mean sea level.   (D) Areas showing same pressure.

46.   Tropic of cancer passes through _____sate.
       (A) Mizoram   (B) Bihar
       (C) U.P   (D) Nagaland

47.   Arrange the following Sancturaires/ National parks of India from North to Southdirection.
       I.   Bandipur   II.   Sariska
       III. Dachigam   IV.   Periyar
       (A) I   IV   III   II   (B) III   IV   II   I
       (C) III   II   I   IV   (D) I   III   II   IV

48.   Sivasamudram waterfall is formed by _____ river.
       (A) River Kaveri   (B) River Tapti
       (C) River Narmada   (D) River Godavari

49.   Which of the following statement is correct about sugarcane crop?
       (A) It grows well in hot climate with a temperature of 25°C
       (B) The major sugarcane producing states are Himachal and Haryana
       (C) it is a tropical as well as subtropical crop, grows well in hot and humid climate
       (D) India is the first largest producer of sugarcane

50.   Which of the following industries uses bauxite as a raw material?
       (A) Aluminium   (B) Cement
       (C) Jute   (D) Steel

51.   Which of the following is not a non-ferrous mineral?
       (A) Bauxite   (B) Copper
       (C) Zinc   (D) Manganese

52.   Which of the following mountain peak does not lie in India?
       (A) NamchaBarua   (B) Nanda Devi
       (C) Annapurna   (D) Kamet

53. In the context of France, Taille was _____
    (A) Direct tax levied by the state
    (B) A tax levied by the church
    (C) The tax levied on the articles of everyday consumption
    (D) None of these

54. Find out the incorrect statements with regard to Rowatt Act.
    (i) Rowlatt Act was passed in 1919
    (ii) The act allowed detention of political prisoners without trial for 4 years
    (iii) The act was passed with the consent of Indian members
    (iv) The act allowed detention of political prisoners without trial for two years
    (A) Only I and II   (B) Only III and IV
    (C) Only II and III   (D) Only I and IV

55. Which of the following continent was discovered by Christophe's Columbus?
    (A) America   (B) Africa
    (C) Europe   (D) Asia

56. Which of the following state lead the unification of Germany?
    (A) Rhineland   (B) Hanover
    (C) Prussia   (D) Brunswick

57. Who was the founder of the HoaHao movement?
    (A) PhanBoiChau   (B) HuyunhPhu So
    (C) Liang   (D) Phanchu

58. Which of the following style of education was provided by Tonkin Free School (1907)
    (A) Chinese   (B) French
    (C) Western   (D) Vietnamese

59. James Hargreaves devise _____
    (A) Spinning Jenny   (B) Steam engine
    (C) Spinning wheel   (D) Printing machine

60. Which of the following pair of Author and Novel is correctly matched
    (A) Srinivas --------- Indulekha
    (B) Bankimchander--- Durgesh
      Chattopadhyay ------ Nandini
    (C) DevkiNandan----- Godan
    (D) O.ChanderMeno----- Pariksha Guru

61. The Russian parliament was called as
    (A) Reichstag   (B) National Assembly
    (C) House of commons   (D) Duma

62. Hitler's ideology related to the geopolitical concept of Lebensraum, or living space implied:
    (A) There was no equality between people, but only a racial hierarchy
    (B) Only those species survived on earth that could adapt themselves to changing climatic conditions.
    (C) New territories had to be acquired for settlement to increase the area of the mother country.
    (D) An exclusive racial community of pure Germans to be created by physically eliminating all those who were seen as undesirable

63. Kalangan Community of Java were--------
    (A) Spinners   (B) Shifting cultivators
    (C) Potters   (D) Cattle Herders

64. Which of the following forest communities is wrongly matched.
    (A) Santhals ------- Jharkhand   (B) Oraon -------- Nagaland
    (C) Gonds --------- Chhattisgarh   (D) Khasas ------- Himachal

65. Which of the following State fall in the category of holding together federations?
    (A) Switzerland   (B) Australia
    (C) U S   (D) Spain

66. Match list 1 with list II and select the answer using the order given below the list
I. Pressure group   A.   Assam Gan
II.Long term Movement   B.   Fertilizer dealing association
III.   Single issue movement   C.   Women movement
IV.   Political party   D.   Narmada BachaoAndolan
(A) I - C, II - D, III - A, IV - B   (B) I - B, II - C, III - D, IV - A
(C) I - B, II - D, III - C, IV - A   (D) I - C, II - C, III - B, IV - A

67. Which of the following union territory has its own assembly?
(A) Chandigarh   (B) Lakshaweep
(C) Puducherry   (D) Daman and diu

68. In which of the following country the participation of women in public life is highest.
(A) Denmark   (B) Estonia
(C) Slovakia   (D) Norway

69. How long can the RajyaSabha delay the money bill passed by the loksabha.
(A) 7 days   (B) 20 days
(C) 25 days   (D) 14 days

70. By which constitutional amendment two words 'secular' and 'Socialist' were added in the preamble of the Indian Constitutions
(A) 44th (B) 80th
(C) 42nd (D) 52nd

71. In which year South Africa become a democratic country.
(A) 26 April 1995   (B) 26 May 1996
(C) 26 April 1994   (D) 25 April 1996

72. Which of the following statement about Kosovo is correct?
(A) Before partition, Kosovo was a province of Russia
(B) There were majority of the Albanian people in this province
(C) Massacre of serbs took place
(D) Albanian nationalist Milosevic had won the election

73. Infant mortality refers to the death of child before completing the age of
(A) 1 year   (B) 2 year
(C) 3 year   (D) 5 year

74. Which organization carries out survey for determining the poverty line?
(A) NSSO   (B) CSO
(C) Planning commission   (D) None of the above

75. The price announced by the Government before the sowing season is called
(A) Minimum Price   (B) Support price
(C) Market Price   (D) Issue price

76. Which of the following group of countries has better performance in terms of human development than India?
(A) Bhutan, Srilanka, Nepal   (B) Pakistan, Bangladesh, Srilanka
(C) Srilanka, Indonesia, Cuba   (D) Ghana. Kenya, Bangladesh

77. What do you mean by collateral?
(A) It is the total sum of money with a person   (B) It is things kept in the locker
(C) It is guarantee given by the borrower to the lender   (D) It is the security to a lender until the loan is repaid

78. Right to choose, Right to seek represent, Right to represent and Right to be informed are
(A) Fundamental Rights   (B) Consumer rights
(C) Fundamental duty   (D) Consumer Movement

79. In India who directly controls the 'Monetary policy'
(A) Finance department of India   (B) Reserve bank of India
(C) State bank of India   (D) Prime Minister of India

80. On the basis of ownership types of economy are:
(A) Capitalistic, Socialistic, Developing-Economy.   (B) Socialistic, Mixed, Developing-Economy.
(C) Capitalistic, Socialistic, Mixed-Economy.   (D) Mixed, Developed, Developing-Economy

MATHEMATICS

81. If $\left(\sqrt[3]{2}\right)^{12} \times \left(\sqrt{5}\right)^{8} = \left[(2 \times 5)^2\right]^x$ then the value of x is _____.

(A) 4　　　　　　　　　　　　　　　　(B) 2
(C) 10　　　　　　　　　　　　　　　(D) 12

82. The average of 9 numbers is 18. If the average of first five numbers is 19 and the average of last 5 numbers is 17, find the 5th number.

(A) 16　　　　　　　　　　　　　　　(B) 20
(C) 18　　　　　　　　　　　　　　　(D) 22

83. In ⊔ PQR, PQ = PR and X is the midpoint of PQ. XY is parallel to QR and meets PR at point Y. What kind of triangle is PXY?

(A) Isosceles　　　　　　　　　　　(B) Scalene
(C) Equilateral　　　　　　　　　　 (D) Right triangle

84. If α, β are roots of polynomial 6x + K such that $\alpha^2 + \beta^2 + \alpha\beta = \dfrac{8}{3}$, then find the value of K.

(A) -8　　　　　　　　　　　　　　　(B) 8
(C) -4　　　　　　　　　　　　　　　(D) 8

85. If $x^2 - 5x + 1 = 0$ then the value of $x^5 + \dfrac{1}{x^5}$ is-------------

(A) 2025　　　　　　　　　　　　　 (B) 2725
(C) 2225　　　　　　　　　　　　　 (D) 2525

86. If $Cosec\theta + Sin\theta = 2$, then the value of $Cosec^{50}\theta + Sin^{50}\theta$ is----------

(A) 2　　　　　　　　　　　　　　　(B) 100
(C) 0　　　　　　　　　　　　　　　(D) 50

87. The sum of squares of two consecutive even numbers added by 4is always divisible by-----------

(A) 24　　　　　　　　　　　　　　　(B) 16
(C) 8　　　　　　　　　　　　　　　(D) 32

88. If $Cosec\,4x = Sec5x$, then the value of $Sin3x + Cos6x$ is----------

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

89. The ratio of radius of base to the height of a right circular cylinder is 1:2. If its volume is 2156 cm^3, then its total surface area is-----

(A) 1024 cm^2　　　　　　　　　　(B) 924 cm^2
(C) 874 cm^2　　　　　　　　　　 (D) 1204 cm^2

**90.** In the given figure, MP = 16, MQ = 10The value of MO × MS is---------
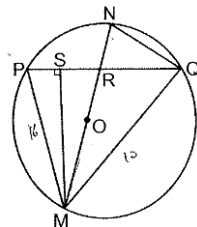
(A) 160　　　　　　　　　　　　　　(B) 100
(C) 120　　　　　　　　　　　　　　(D) 80

91. The 7th term of an AP is 5 times the first term and its 9th term exceeds twice the 4th term by 1. The first term of the AP is--------

(A) 151　　　　　　　　　　　　　　(B) -39
(C) 3　　　　　　　　　　　　　　　(D) – 124

92. Find the centre of circle passing through the points (1,4) (-2,6) and (3,7).

(A) (1,1)　　　　　　　　　　　　　(B) (0,0)
(C) $\left(\dfrac{1}{2}, \dfrac{7}{2}\right)$　　　　　　　　　　　(D) $\left(\dfrac{1}{2}, \dfrac{13}{2}\right)$

93. The length of shadow of a building, when the sun's altitude is 60^0 , is 20 m less than what it was when it was 45^0. The height of the building is ------------
  (A) 54.48 m (B) 47.32 m
  (C) 64.32 m (D) 57.48 m

94. If
$$\frac{6^6 + 6^6 + 6^6 + 6^6 + 6^6 + 6^6}{2^6 + 2^6} \times \frac{5^6 + 5^6 + 5^6 + 5^6 + 5^6}{3^6 + 3^6 + 3^6} = 5^n$$
then the value of n is _____
  (A) 6 (B) 0
  (C) 12 (D) 7

95. In the given Figure, the value of $\angle P \times R$ is_____
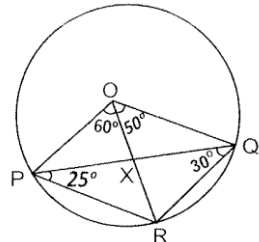
  (A) 580^0 (B) 100°
  (C) 95^0 (D) 120^0

96. If $x^m \cdot y^n – 7889$, where x and y are prime numbers, the value of x + y is_____
  (A) 30 (B) 60
  (C) 100 (D) 300

97. If $a = \dfrac{P-q}{P+q}, b = \dfrac{q-r}{q+r}, c = \dfrac{r-p}{r+p}$, then the value of $\dfrac{(1+a)(1+b)(1+c)}{(1-a)(1-b)(1-c)}$ is----------
  (A) 1 (B) 0
  (C) 121 (D) 11

98. If radius of a right circular cylinder is increased by 10% and height is decreased by 10% its volume will
  (A) increase by 9.8% (B) decrease by 9.8%
  (C) increase by 8.9% (D) decrease by 8.9%

99. The perimeter of a right isosceles triangle is $\left(2+\sqrt{2}\right)$m. The length of its hypotenuse is---------
  (A) 2m (B) 4m
  (C) $\sqrt{6}$m (D) $\sqrt{2}$m

100. A fraction becomes $\dfrac{5}{7}$ if 2 is added to both its numerator and denominator. If 4 is added to numerator and 3 is added to denominator, the fraction becomes $\dfrac{7}{8}$. Find the original fraction.

  (A) $\dfrac{8}{11}$ (B) $\dfrac{3}{5}$
  (C) $\dfrac{5}{11}$ (D) $\dfrac{7}{9}$

SCHOLASTIC APTITUDE TEST

NTSE – 2017

ANSWERS

1.	C	2.	C	3.	B	4.	A
5.	C	6.	A	7.	D	8.	A
9.	C	10.	B	11.	C	12.	D
13.	A	14.	D	15.	A	16.	C
17.	A	18.	B	19.	C	20.	D
21.	B	22.	D	23.	B	24.	B
25.	A	26.	C	27.	B	28.	G
29.	B	30.	C	31.	A	32.	D
33.	C	34.	A	35.	C	36.	A
37.	A	38.	C	39.	B	40.	B
41.	C	42.	C	43.	B	44.	D
45.	C	46.	A	47.	C	48.	A
49.	C	50.	A	51.	D	52.	C
53.	A(G)	54.	C	55.	A	56.	C
57.	B	58.	C	59.	A	60.	B
61.	D	62.	C	63.	B	64.	B
65.	D	66.	B	67.	C	68.	D
69.	D	70.	C	71.	C	72.	B
73.	A	74.	A	75.	B	76.	C
77.	D(G)	78.	B	79.	B	80.	C
81.	B	82.	C	83.	A	84.	D
85.	D	86.	A	87.	C	88.	A
89.	B	90.	D	91.	C	92.	D
93.	B	94.	D	95.	C	96.	A
97.	A	98.	C	99.	D	100.	B

HINTS & SOLUTION
BIOLOGY

1.   **C**. Regeneration

In example shoune in fig the organism is Planaria (Dugesia)

2.   **C.** I (Imunoagluttinin gene)

3.   **B.** Diabetes is non infectious.

4.   **A.** 'B' Indicates Pituitary gland.

5.   **C.** Cytokinins induce cell division in pants.

6.   **A.** Holozoic nutrition.
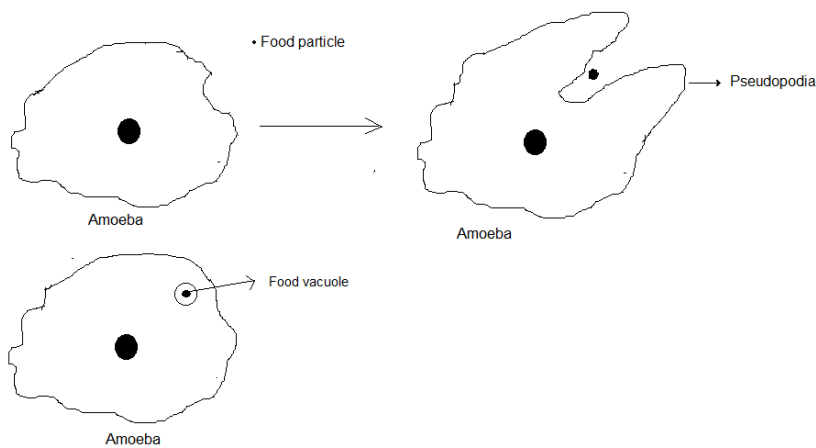
7.   **D.**   Phloem transports food.

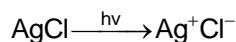8.   **A.**   Living organisms are biotic components of ecosystem.

9.   **C.**   Iris

10.   **B.**
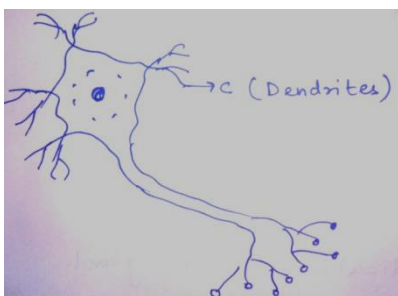
11.   **C.** Lysosomes are suicidal bags.

12.   **D.** Tendons connects Bones to muscles.

13.   **A.**

14.   **D.**

CHEMISTRY

15.   **A.** AgCl is decomposed photochemically into sunlight and turns grey

$$AgCl \xrightarrow{hv} Ag^+Cl^-$$

Used in black and white photography

16.   **C.**   Carbonic acid (H_2CO_3) is an inorganic acid , rest are organic acids

17.   **A.** $+4 \xrightarrow{O.N\downarrow} +2 \Rightarrow$ reduction

$$MnO_2 \longrightarrow MnCl_2$$

$$HCl^{-1} \xrightarrow[O.N\uparrow Ze]{} Cl_2^0$$
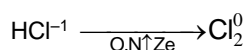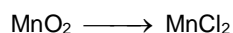
(Oxidation)

18.   **B.**   Atmoshphere of venus is made up of thick clouds of H_2SO_4

19.   **C.**   Aqua regia, also called royal water is the most corrosive, mixture in world used to corrode "Pt" and "Au"

20.   **D.**   Iodine though non-metals, but it is bluish- black Cautious solid

21.   **B.**   Sugarcane

22.   **D.**   Head of a soap molecule is polar and Hydrophilic

24.   **B.**   Eka alumimium $\rightarrow$ Gallium

25.   **A.**   Cobalt -60 is radioisotope and used in gamma ray therapy for cancer treatment

26.   **B.**   Face cream is an example of emulsion

PHYSICS

27.   **Ans. B**
       Solution R = 2f

28.   R = + 3m, $f = +\dfrac{3}{2}$, $4 = -5m$

$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$

$$\frac{1}{v} = \frac{1}{f} - \frac{1}{u} = \frac{1}{3/2} - \frac{1}{5} = \frac{2}{3} + \frac{1}{5} = \frac{10+3}{15} = \frac{13}{15}$$
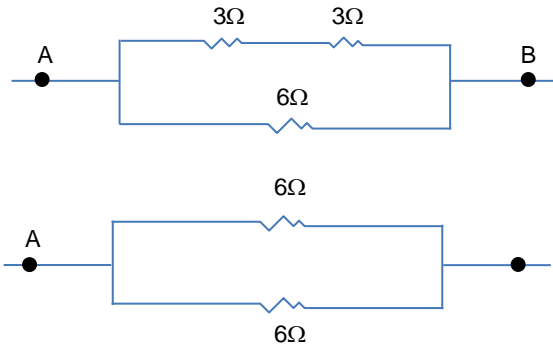
$$v = \frac{15}{13}m$$

(This question should be graced)

29.   **Ans. B**
       Lens in Contact = P = $P_1 + P_2 + P_3$

30.   Ans. C

$$\frac{R_1}{R_2} = \frac{\rho_1\, L_1 \times A_2}{A_1 \times \rho_2\, L_2} = \frac{2}{3} \times \frac{3}{4} \times \frac{5}{4} = \frac{5}{8}$$

31.   Ans. A

$$\frac{1}{R_p} = \frac{1}{b} + \frac{1}{b} = \frac{1}{3} \Rightarrow R_p = 3\Omega$$

32.   Ans. D

$$R = \frac{\rho L}{A} \Rightarrow \rho = \frac{RA}{L}$$

S. I. unit = Ωm

33.   Ans. C

$$H = \frac{V^2}{R}t$$

$$100 = \frac{V^2}{4}x1$$

$$V^2 = 400$$

$$V = 20$$

34.   Ans. A

$$\frac{R_1}{R_2} = \frac{V_1^2}{P_1} \times \frac{P_2}{V_2^2} = \frac{220 \times 220 \times 50}{110 \times 110 \times 100} = \frac{2}{1}$$

35.   Ans. C

Induced e.m.f depends upon Number of turns, velocity of magnet ,B,

$$i = \frac{E_{ind}}{R} = \frac{E_{ind}(N,v,B)}{\lambda N} \quad (\lambda \text{ is resistance per turn})$$

CHEMISTRY

36.   A. ethyl mercaptan has foul smell which is used detect leakage of LPG C_2H_5SH is ethyl mercaptan

37.   Ans. D

PHYSICS

38.   Ans. C

Solar constant $= \dfrac{E}{A.t} = \dfrac{P}{t}$

39.   Ans. B

40.   Ans. B

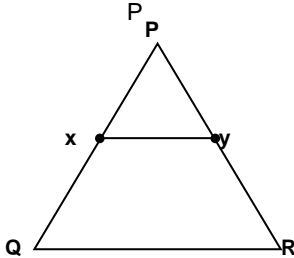$$2d = v \times t$$

$$2 \times d = 340 \times 1.8$$

$$d = \frac{340 \times 18}{2 \times 10} = 306m$$

MATH

81. $2^4 \times 5^4 = 2^{2x}.5^{2x}$

   $\Rightarrow 2x = 4$

   $\Rightarrow x = 2$

82.   Avg. = 18

   Sum of 9 nos.   = 9 × 18 = 162

   Sum of 10 nos. = 19 × 5 + 17 × 5

      = 180

83.   5th no. = 18

   By BPT,   XY||QR

   PQ = PR

84. $\alpha + \beta = -2, \alpha\beta = \dfrac{k}{3}$

   4 sing above we get, $\alpha^2 + \beta^2 + \alpha\beta = \dfrac{8}{3}$

   $\Rightarrow k = 4$

85. $x^5 = -x^3 + 5x^4$ 1 $fx, \dfrac{1}{x}$ are roots of

   $\Rightarrow \dfrac{1}{x^5} = \dfrac{5}{x^4} - \dfrac{1}{x^3}$ 2 $x^5 - 5x + 1 = 0$

   $1 + 2,$ we get

   $x^5 + \dfrac{1}{x^5} = 2525$

86. $\cos ec\theta + \sin\theta = 2$

   $\Rightarrow \theta = \dfrac{\pi}{2}$

87. $2p, 2p + 2$

   $(2p)^2 + 2p + 2)^2 + 4$

   $= 8p^2 + 8p + 8$

88. $\cos ec4x = \cos ec(90^o - 5x)$

   $\Rightarrow 9x = 90^o$

   $\Rightarrow x = 10^o$

89. $h = 2r,$

   $\pi r^2 h = 2156$

   $\Rightarrow r = 7$

   T.S.A $= 2\pi rh + 2\pi r^2 = 924$
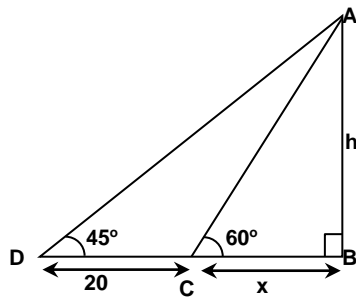
90. $\triangle PMS \square \triangle NMQ$

$\Rightarrow \dfrac{PM}{NM} = \dfrac{MS}{MQ} \Rightarrow 2r \times MS = 160$

$\Rightarrow MO \times MS = 80$

91.   a + 6d = 5a
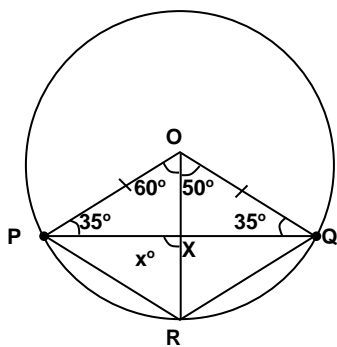6d = 4a
Now, a + 8d = 2(a + 3d) + 1
$\Rightarrow d = 2, a = 3$

92.
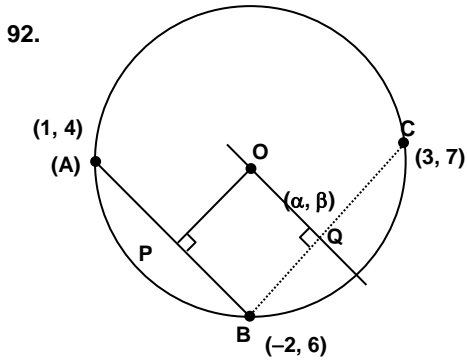
$m_{AB} \times m_{OP} = -1$
$m_{BC} \times m_{OQ} = -1$

93. $9n\triangle ABC$

$\dfrac{h}{x} = \sqrt{3}$ 1

$9n\triangle ABD$

$h = x + 20$ 2

$using\ 1\ \&\ 2$

$h = 47.32 m$

94. $\dfrac{5.6^6}{2.2^6} \times \dfrac{5.5^6}{3.3^6} = 5^7$

95. $x^\circ = 35^\circ + 60^\circ = 95^\circ$

96. $x^m y^n = 7889$

$\Rightarrow 7^3 \times 23^1 = 7889$

$\Rightarrow x + y = 7 + 23 = 30$

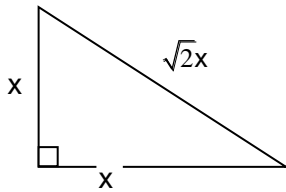**97.** As per question, $p = q = r = 1$ (we can tape)
So $a = b = c = 0$

98. $r^1 = r + \dfrac{10r}{100} = \dfrac{11}{10}r$

$h^1 = \dfrac{9h}{10}$

Change $= \left(\dfrac{7089}{1000} - 1\right) \times 100 = 8.9\%$ in crease

(%)

99. $2x + \sqrt{2}x = (2 + \sqrt{2}) \Rightarrow x = 1$

100. $\dfrac{x+2}{y+2} = \dfrac{5}{7}, \dfrac{x+4}{y+3} = \dfrac{7}{8}$

Solving, we get $\dfrac{x}{y} = \dfrac{3}{5}$