

Maximum Marks: 80



Time allowed: 150 MINS

LEAD TALENT SEARCH EXAM - LTSE 2018

A Project by LEAD Trust, Bangalore.

ENTRANCE TEST FOR 10TH STANDARD STUDENTS FOR 2 YEAR RESIDENTIAL PU COACHING AT PARTNER INSTITUTIONS FOR COMPETITIVE ENGINEERING / MEDICAL ENTRANCE TESTS

Selected students qualify for freeships/scholarships for admission into Partner Colleges in Karnataka and Kerala. The students will be provided extensive coaching for IIT-JEE 2020 / Karnataka CET 2020 / Kerala KEAM 2020 / NEET-UG (formerly AIPMT) entrance exams.

NAME OF THE STUDENT :

NAME OF THE SCHOOL :

REGISTRATION NUMBER (6-digit code number in OMR)

TELEPHONE NUMBER (as mentioned in the application form):.....

EMAIL ID (as mentioned in the application form) :.....

INSTRUCTIONS TO THE CANDIDATE:

- This question paper consists of 5 sections out of which only 4 need to be attempted. Sections I, II and III are compulsory. From Sections IV and V, Students opting for Engineering need to attempt Section IV (Maths) and Students opting for Medical need to attempt Section V (Biology).**
 - Section I Physics – 20 questions
 - Section II Chemistry – 20 questions
 - Section III Logical Reasoning – 20 questions

} **Compulsory for all**

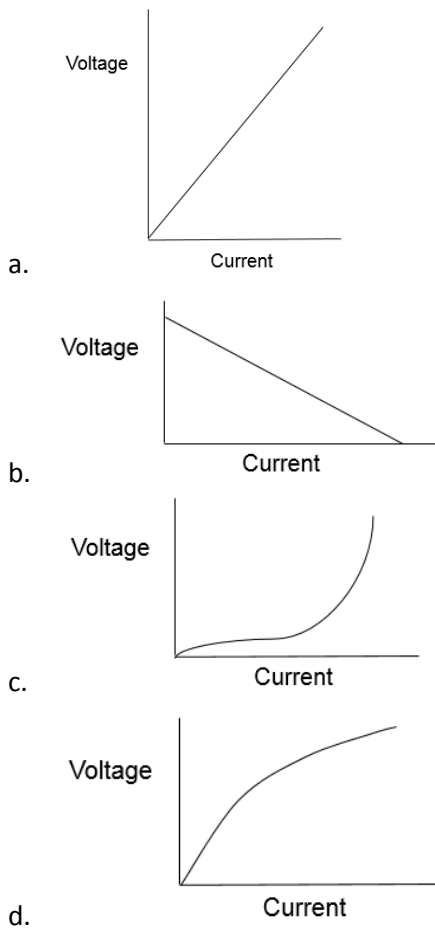
 - Section IV Mathematics – 20 questions → **For Engineering aspirants**
 - Section V Biology – 20 questions → **For Medical aspirants**
- Each question contains four alternatives out of which only ONE is correct.
- Indicate your answers **ONLY** on the OMR sheet. **If you are not attempting Section IV, then leave questions 61 to 80 as blank in OMR sheet. If you are not attempting Section V, then leave questions 81 to 100 as blank in OMR sheet.**
- NEGATIVE MARKING:** Each correct answer will be awarded one mark, $\frac{1}{4}$ marks will be deducted for each incorrect answer. More than one answer marked against a question will be deemed as an incorrect response and will be negatively marked.
- Use of Calculators, Smartphones and Electronic devices is NOT allowed.

IMPORTANT	
PROCEDURE OF FILLING UP THE ANSWERS IN OMR SHEET	
Wrong Filling	Right Filling
Tick mark	Fully darken with HB Pencil
Cross mark	Fully darken with HB Pencil
Half filled or semi dark	Fully darken with HB Pencil
Light filled	Fully darken with HB Pencil

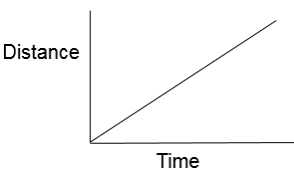
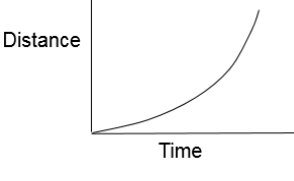
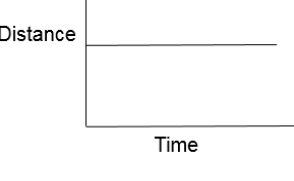
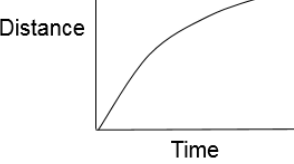
Section I: Physics

1. An engineer is designing the runway for an airport. Of the planes that will use the airport, the lowest acceleration rate is likely to be 3 m/s^2 . The take-off speed for this plane will be 66 m/s . Assuming this minimum acceleration, what is the minimum allowed length for the runway?
 - a. 800 m
 - b. 726 m
 - c. 1000 m
 - d. 198 m
2. A goalkeeper in a game of football pulls his hands backwards after holding the ball shot at the goal post. This enables the goalkeeper to
 - a. exert larger force on the ball
 - b. reduce the force exerted by the ball on hands
 - c. increase the rate of change of momentum
 - d. decrease the rate of change of momentum
3. The gravitational force between two objects is F . If masses of both objects are halved and the distance between them is also halved, then the gravitational force would become
 - a. $F/6$
 - b. $F/4$
 - c. $F/2$
 - d. F
4. When a body is placed in a liquid, the buoyant force experienced by it is equal to the
 - a. Weight of the liquid displaced
 - b. Volume of the liquid displaced
 - c. Weight of the body
 - d. Volume of the body
5. Newton-meter is the SI unit of
 - a. Acceleration
 - b. Power
 - c. Work
 - d. Force

6. In longitudinal waves, the particles vibrate in a _____ direction of propagation.
- a. Parallel
 - b. Perpendicular
 - c. Curved
 - d. Both parallel and perpendicular
7. As you move an object away from a convex mirror, its image becomes _____ and moves towards _____
- a. Smaller, infinity
 - b. Enlarged, infinity
 - c. Smaller, focus
 - d. Enlarged, focus
8. Which of the following graph correctly represents the relationship between current and voltage for a closed circuit?



9. Which of the following graphs represents the uniform motion of a moving object

- a. 
- b. 
- c. 
- d. 

10. A cricket ball of mass 70 g moving with a velocity 0.5 m/s is stopped by a player in 0.5 s. What is the force applied by the player to stop the ball?

- a. 70 N
- b. 0.7 N
- c. 7 N
- d. 0.07 N

11. The earth's gravitational force causes an acceleration of 5 m/s^2 in a 1 Kg mass somewhere in space. How much will the acceleration of a 3 Kg mass be at the same place?

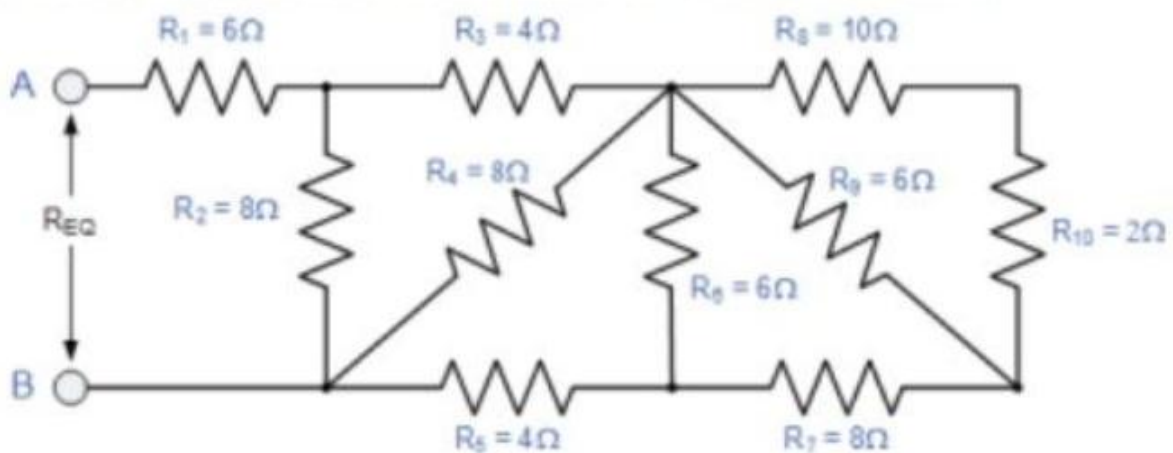
- a. 15 m/s^2
- b. 1.3 m/s^2
- c. 0.6 m/s^2
- d. 5 m/s^2

12. The volume of a 50 g sealed packet is 350 cm^3 . If the density of water is 1 g/cm^3 , the packet will

- a. Float
- b. Sink
- c. Data is not enough
- d. None of these

13. An object is placed at a distance of 40 cm from a concave mirror of focal length 15 cm. If the object is displaced through a distance of 20 cm towards the mirror, by how much distance is the image displaced?
- 36 cm
 - 24 cm
 - 60 cm
 - 20 cm
14. What is the focal length of a lens that produces a real image three times as large as the object if the distance between the object and the image is 1 m?
- 37.5 cm
 - 25 cm
 - 18.75 cm
 - 75 cm

15. What is the total resistance (R_{eq}) between the terminals A and B in the given circuit diagram ?



- 60Ω
 - 4Ω
 - 8Ω
 - 10Ω
16. A potential difference of 250 V is applied across a resistance of 1000Ω . The heat energy produced in the resistance in 10 s is
- 625 J
 - 25 kJ
 - 4 J
 - 40 J

17. A sound wave of frequency 5000 Hz travels in the air with speed of 350 m/s. The wavelength of the wave is
- 7 m
 - 0.07 m
 - 7 nm
 - 0.07 nm
18. A bullet of 5 g is fired from a pistol of 1.5 kg. If the recoil velocity of the pistol is 1.5 m/s, the recoil velocity of the bullet is
- 5 m/s
 - 0.005 m/s
 - 450 m/s
 - 300 m/s
19. In which of the following cases, current in the loop will not be induced?
- The loop is moved in the direction of the magnet
 - The magnet is moved in the direction of the loop
 - The loop and magnet are moved in opposite direction with same velocity
 - The loop and magnet are moved in the same direction with same velocity
20. A concave lens of suitable focal length is used for correcting a
- myopic eye
 - hypermetropic eye
 - both a and b
 - none of these

Section II: Chemistry

21. Which of the following is NOT an oxidising agent?

- a. Oxygen
- b. Hydrogen
- c. Con. sulphuric acid
- d. Chlorine

22. Which of the following is a neutral oxide?

- a. NO
- b. NO₂
- c. N₂O₅
- d. CO₂

23. When a burning splinter is brought near the gas jar containing hydrogen gas, a popping sound is observed. It is due to

- a. Endothermic
- b. Redox reaction
- c. Exothermic and Endothermic
- d. Exothermic

24. Which of the following metals cannot be reduced by carbon?

- a. Iron
- b. Magnesium
- c. Zinc
- d. Lead

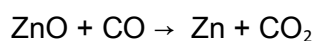
25. Available chlorine is formed when bleaching powder reacts with

- a. dilute acid
- b. dilute base
- c. nascent oxygen
- d. Chlorine

26. Which of the following has odour ?

- a. Hydrogen
- b. Ammonia
- c. Nitrogen
- d. Oxygen

27. Which of the statements about the reaction is correct ?

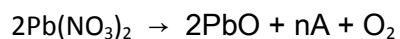


- a. ZnO is being reduced
- b. CO is being reduced
- c. CO₂ is being oxidised
- d. ZnO is being oxidised

28. The lightest liquid metal is:

- a. Hg
- b. Ga
- c. Cs
- d. Fr

29. What is nA in the following reaction ?



- a. 4NO
- b. 4NO₂
- c. 2PbNO₂
- d. NO₂

30. Which of the following is an odd compound ?

- a. Ethene
- b. Ethane
- c. Ethyne
- d. Acetylene

31. Which of the following is NOT an inert gas ?

- a. Br
- b. Ar
- c. He
- d. Rn

32. Major constituent of LPG is

- a. Ethene
- b. Butane
- c. Propene
- d. Pentane

33. Modern periodic table is based on

- a. Atomic mass
- b. Mass number
- c. Atomic number
- d. Atomic volume

34. Transition elements are mostly used as construction materials because they are

- a. Hard
- b. Rigid
- c. Both a and b
- d. Flammable

35. Zinc forms only one ion Zn^{2+} by completing its

- a. 3d orbital
- b. 2d orbital
- c. 3s orbital
- d. 2s orbital

36. Which of the following has maximum number of atoms ?

- a. 18g of H_2O
- b. 18g of O_2
- c. 18g of CO_2
- d. 18g of CH_4

37. Number of electrons present in Phosphorous (P) is 15. Valence electrons shall be

- a. 2
- b. 8
- c. 5
- d. 4

38. The conversion of solid to gas directly is called

- a. Evaporation
- b. Sublimation
- c. Distillation
- d. Condensation

39. The oxygen atom has 8 protons and 8 electrons .The oxide (O^{2-}) will have

- a. 6 protons and 8 electrons
- b. 8 protons and 6 electrons
- c. 10 protons and 8 electrons
- d. 8 protons and 10 electrons

40. The third member of alkane series and fourth member of alkene series differ by

- a. CH_2
- b. C_2H_4
- c. H_2
- d. C

Section III: Logical Reasoning

41. An accurate clock shows 8 o'clock in the morning. Through how many degrees will the hour hand rotate when the clock shows 2 o'clock in the afternoon?
- 144 degrees
 - 150 degrees
 - 168 degrees
 - 180 degrees
42. Donkeys : bray :: Geese : ?
- Growl
 - Hum
 - Cackle
 - Simper
43. In a class of some students standing in a straight line, the position of Ben is 11th from left end and 41st from right end. How many students are there in the class?
- 52
 - 55
 - 50
 - 51
44. Find the missing one: ED : HG :: RQ : ?
- UM
 - VM
 - UT
 - UP
45. A family consists of six members P, Q, R, X, Y and Z. P and R are married couple. Q is the son of R but R is not the mother of Q. Y is the brother of R. X is the daughter of P. Z is the brother of P. How many female members are there in the family?
- One
 - Two
 - Three
 - Four

46. If Ahmed says, "Rafi's mother is the only daughter of my mother", How is Ahmed related to Rafi?

- a. Brother
- b. Father
- c. Uncle
- d. Grandfather

47. A man walks 20 m towards South. Then turning to his right he walks 30 m. Then turning to his left he walks 20 m. Again turning to his left he walks 30 m. How far is he from his starting position?

- a. 20 m
- b. 40 m
- c. 80 m
- d. 60 m

48. Get odd one out

- a. 6:23
- b. 3:11
- c. 1:3
- d. 5:18

Instruction for Question number 49 and 50: If '+' is 'x', '-' is '+', 'x' is '÷' and '÷' is '-', then answer the following with the **closest integer** based on this information.

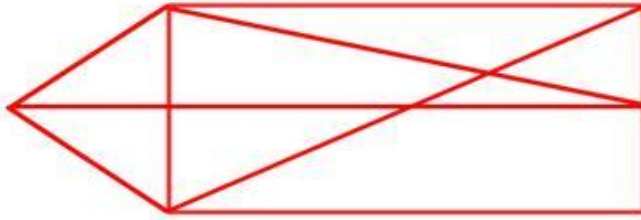
49. $9 \div 5 + 4 - 3 \times 2 = ?$

- a. -10
- b. 2
- c. -9
- d. 3

50. $5 \times 4 - 6 \div 3 + 1 = ?$

- a. 5
- b. 4
- c. -1
- d. 2

51. How many triangles are there in the given figure ?



- a. 15
- b. 14
- c. 12
- d. 13

52. If GUN = 42 and ME = 18, then HOME = ?

- a. 41
- b. 51
- c. 31
- d. 21

53. If the second half of alphabet series is written first and then the first half is arranged in reverse order. Then which of the following will be the 5th letter to the left of 16th letter from the right?

- a. S
- b. T
- c. P
- d. F

54. Complete the series 2, 5, 17, 71,...

- a. 249
- b. 359
- c. 512
- d. 358

55. Complete the series 4, 2, 5, 1,...

- a. 0
- b. 6
- c. 7
- d. 3

56. A is B's sister. C is B's mother. D is C's father. E is D's mother. How is A related to D?

- a. Granddaughter
- b. Grandmother
- c. Grandfather
- d. Daughter

57. If FRIEND is coded as HUMJTK, how is CANDLE written in that code?

- a. DCQHQB
- b. EDRIRL
- c. ESJFME
- d. DEQJQM

58. Horse : Jockey :: Car : ?

- a. Chauffer
- b. Steering
- c. Mechanic
- d. Brake

59. Choose the word which is least like the others word in a group?

- a. Day
- b. Clock
- c. Calendar
- d. Month

60. A tailor had a number of shirt pieces to cut from a roll of fabric. He cut each roll of equal length into 10 pieces. He cut at the rate of 45 cuts a minute. How many rolls would be cut in 24 minutes?

- a. 120
- b. 108
- c. 54
- d. 32

Section IV: Mathematics

61. If $(x^{1000} + 3x^{999} + k = 0)$ is divisible by $(x + 1)$, then the value of k is
- 1
 - 0
 - 2
 - 1
62. If $\frac{x}{y} + \frac{y}{x} = -1$ where $x \neq 0$ and $y \neq 0$, then the value of $x^3 + y^3$ is
- 1
 - 0
 - 2
 - 4
63. The monthly income of A and B are in the ratio 4:3. Each of them saves Rs. 600. If the ratio of their expenditure is 3:2, then the monthly income of A is
- 2400
 - 1800
 - 2000
 - 3600
64. If one of the roots of $3x^2 + 11x + k = 0$ is reciprocal of the other, then the value of k is
- 1
 - 2
 - 3
 - 4
65. The average temperature for Monday, Tuesday and Wednesday was $40^\circ C$. The average temperature for Tuesday, Wednesday and Thursday is $41^\circ C$. If the temperature on Thursday is $42^\circ C$, the temperature on Monday was
- $37^\circ C$
 - $38^\circ C$
 - $39^\circ C$
 - $40^\circ C$

66. The area of a rhombus each one of whose sides measures 20 cm, and one diagonal is 24 cm, is

- a. 380 cm^2
- b. 384 cm^2
- c. 390 cm^2
- d. 400 cm^2

67. The sum of all odd numbers between 100 and 200 is

- a. 6200
- b. 6500
- c. 7500
- d. 3750

68. Find the ratio in which the line segment joining A(1, -5) and B(-4, 5) is divided by the x-axis.

- a. 1 : 1
- b. 2 : 3
- c. 2 : 1
- d. 3 : 2

69. A rectangular park is to be designed whose breadth is 3m less than its length. Its area is to be 4 square metres more than the area of a park that has already been made in the shape of an isosceles triangle with its base as the breadth of the rectangular park and altitude 12m. The length and breadth are

- a. 8m, 5m
- b. 6m, 3m
- c. 9m, 6m
- d. 7m, 4m

70. A die is thrown 1000 times with the frequencies for the outcomes 1, 2, 3, 4, 5, 6 as given in the table

Outcome	1	2	3	4	5	6
Frequency	179	150	157	149	175	190

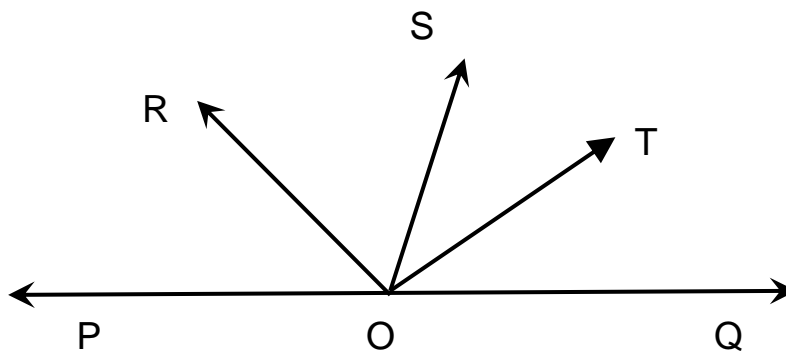
The probability of getting six is

- a. 0.81
- b. 0.19
- c. 0.15
- d. 1.0

71. Rational form of $2.5\overline{601}$ is

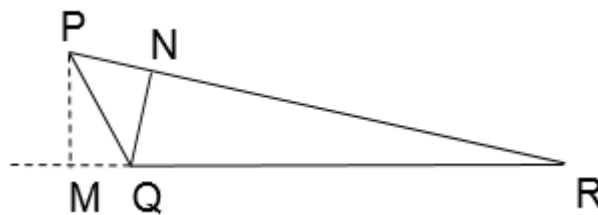
- a. $\frac{2563}{1150}$
- b. $\frac{5069}{1980}$
- c. $\frac{25045}{9900}$
- d. $\frac{250}{99}$

72. In the given figure, ray OS stands on a line POQ. Ray OR and ray OT are angle bisectors of angles POS and SOQ respectively. If angle POS = y , angle ROT equals



- a. $90 - \frac{y}{2}$
- b. $180 - y$
- c. 90°
- d. 60°

73. In ΔPQR side QR = 10 cm, height PM = 4.4 cm. If PR = 11 cm, then altitude QN equals



- a. 3 cm
- b. 4.4 cm
- c. 6 cm
- d. 4 cm

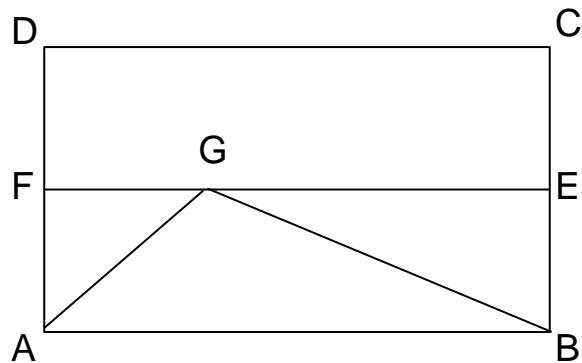
74. $\frac{1+\tan^2\theta}{\sec\theta} \times \frac{\cot\theta}{\operatorname{cosec}\theta}$ is equal to

- a. 1
- b. $\sec^2\theta$
- c. $\frac{\cot\theta}{1-\tan\theta}$
- d. $\frac{\sec^2\theta}{\tan\theta}$

75. If $\sec\theta + \tan\theta = x$ then $\tan\theta$ is equal to

- a. $\frac{x^2+1}{2x}$
- b. $\frac{x^2-1}{2x}$
- c. $\frac{x^2+1}{x}$
- d. $\frac{x^2-1}{x}$

76. If ABCD is a rectangle, E, F are mid-points of BC and AD respectively and G is any point on EF, then the area of the triangle GAB is equal to



- a. $\frac{1}{2}$ th of the area of ABCD
- b. $\frac{1}{3}$ th of the area of ABCD
- c. $\frac{1}{4}$ th of the area of ABCD
- d. $\frac{1}{6}$ th of the area of ABCD

77. Two concentric circles are of radii 13 cm and 12 cm. What is the length of the chord of the larger circle which touches the smaller circle?

- a. 8 cm
- b. 10 cm
- c. 6 cm
- d. 4 cm

78. If $(a + b) : (a - b) = 1 : 5$ then $(a^2 - b^2) : (a^2 + b^2)$ is equal to

- a. 2 : 3
- b. 3 : 2
- c. 13 : 5
- d. 5 : 13

79. A conical flask is full of water. The flask has base radius r and height h . The water is poured into a cylindrical flask of base radius mr . The height of water in the cylindrical flask is

- a. $\frac{h}{3m^2}$
- b. $\frac{3m^2}{h}$
- c. $\frac{h}{m}$
- d. $\frac{m}{h}$

80. The probability of a random leap year having 53 Sundays is

- a. $\frac{53}{366}$
- b. $\frac{1}{7}$
- c. $\frac{2}{7}$
- d. $\frac{53}{365}$

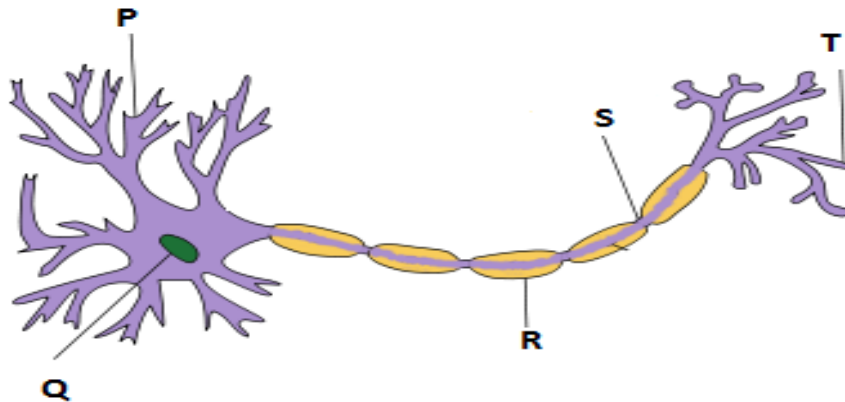
Section V: Biology

81. Select the option with the correct sequence of words to fill the blanks in the given sentences.

- Cod liver oil is a rich source of **(i)**
- Deficiency of vitamin C in body causes a disease known as **(ii)**
- Goiter is caused by the lack of **(iii)** in the diet
- Deficiency of **(iv)** can lead to rickets in children and osteoporosis in adults.

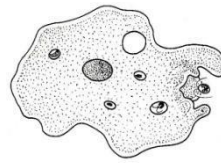
	i	ii	iii	iv
A	Vitamin D	Rickets	Potassium	Magnesium
B	Vitamin A	Scurvy	Iodine	Calcium
C	Vitamin C	Rickets	Iodine	Calcium
D	Vitamin B	Scurvy	Potassium	Magnesium

82. Select the incorrect option in the given figure of a neuron with its parts labeled as P, Q, R, S and T



- a. Part P of this neuron connect with part T of another neuron.
- b. Part R is formed by wrapping of a special cell around S of the neuron.
- c. Part Q is central vacuole that contains signal transmitting compounds.
- d. Part P receives signals and part T carries signal out of the neuron.

83. What is a common character of the below shown animals?



- a. They all live in water
- b. they all lack backbone
- c. the only movable bone is skull is the upper jaw
- d. snakes have hollow bones and birds have flexible backbone

84. Which of the following is NOT true for metaphase stage during cell division?

- a. Centromere of the chromosomes divides.
- b. Chromosomes are arranged at the centre of the cell.
- c. Spindles fibers are found attached to the Centromere of the chromosomes.
- d. The chromosomes acquires different shapes during metaphase.

85. Which of the following statement is true function of ovaries in human female?

- a. the two ovaries release eggs every month.
- b. the two ovaries release the eggs alternatively every month.
- c. the ovary does not produce ova during ovulation.
- d. the ovary secrete androgen during ovulation.

86. Test tube baby means

- a. the egg is fertilized in a test tube and a baby is born in a test tube in the laboratory.
- b. the egg is fertilized in the women's body and the child develops in a test tube.
- c. egg is fertilized in a petri dish and the child develops in a test tube.
- d. egg is fertilized in a petri dish, but development takes place in the uterus.

87. The organ which are structurally different but perform similar functions are said to be:

- a. homologous organs
- b. analogous organs
- c. vestigial organs
- d. functional organs

88. Dinosaur park in India is found in a town near

- a. Maharashtra
- b. Andhra Pradesh
- c. Ahmedabad
- d. Gujarat

89. Select the mismatch pair with respect to bacteria and the disease caused by them.

A	Salmonella Typhi	Typhoid
B	Vibrio Cholerae	Cholera
C	Bacillus Calmette Guerin	Tuberculosis
D	Mycobacterium Tuberculosis	tetanus

90. The aquatic amphibian excretes nitrogenous waste as ammonia because,

- ammonia is highly toxic and cannot be dissolved in water.
- ammonia is less toxic and soluble in water.
- ammonia is most toxic form and require large amount of water.
- ammonia is the only nitrogenous waste produced by amphibian.

91. The common disorder of the kidney is

- Nephritis
- Dialysis
- Kidney stone
- Kidney failure

92. Complete the analogy for the following

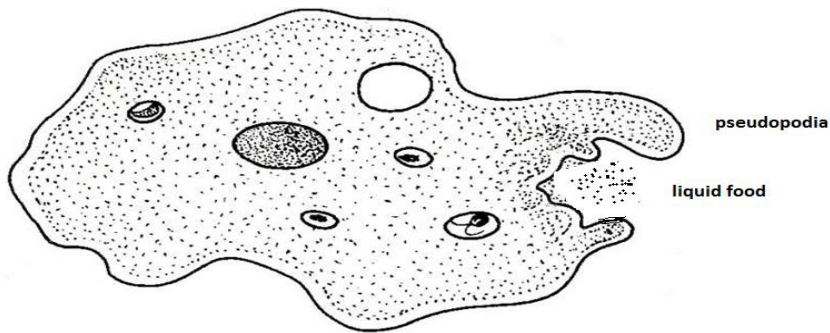
Heart: Cardiac muscles, Small Intestine: _____

- Involuntary muscle
- Striated muscle
- Voluntary muscles
- Smooth muscles

93. The organic components in plants that are produced in one tissue and translocated to another where they produced their effect are called :

- Hormones
- phytohormones
- auxines
- resins

94. In the diagram, which of the following processes is shown in Amoeba?



- a. Exocytosis
- b. Phagocytosis
- c. Pinocytosis
- d. Apoptosis

95. A student completed a genetics exercise by preparing the punnett square drawn below
[Note: 'T' represents a dominant allele and 't' represents a recessive allele]

TT	Tt
Tt	tt

What were the likely genotypes of the parents?

- a. Parent 1 was homozygous , parent 2 was heterozygous
 - b. Parent 1 was heterozygous, parent 2 was homozygous
 - c. Both parents were heterozygous
 - d. Both parents were homozygous
96. Parthenocarpic Guava fruit can be produced by
- a. Removing androecium of flowers before pollen grains are released
 - b. Treating the plant with phenyl mercuric acetate
 - c. Raising the plants from vernalised seeds
 - d. Treating the plant with low concentrations of gibberellic acid and auxins
97. The both sperm and ovum contains 39 chromosomes, the resulting embryo contains _____ chromosomes.
- a. 39
 - b. 78
 - c. 19
 - d. 40

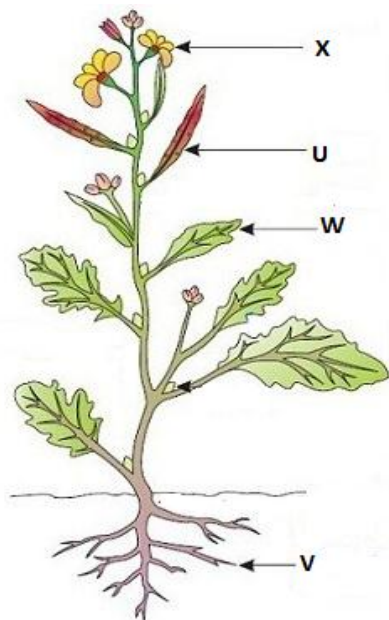
98. Islets of Langerhans secrete _____ and _____

- a. Adrenaline & nor adrenaline
- b. thyroxin and parathormone
- c. Insulin and Glucagon
- d. Estrogen and progesterone

99. The modern apes like orangutan, gorilla and human ancestors are presumed to have evolved from

- a. Australopithecus
- b. Ramapithecus
- c. Homo habilis
- d. Dryopithecus

100. Refer to the given figure showing a typical plant with its parts labeled as U, V, W and X and read the following paragraph.



P is a plant where part U is edible, plant Q has edible part W, plant R has edible part X whereas plant S has edible part V. Select the option that correctly identifies these plants.

	P	Q	R	S
A	Clove	Mustard	Cumin	Ginger
B	Pomegranate	Rose	Orange	Turmeric
C	Pomegranate	Spinach	Clove	Radish
D	Cumin	Rose	Spinach	Potato