

1. Euclid's division lemma states that
for any positive integers a and b ,
there exists unique integers q and r
such that $a = bq + r$, where r must
satisfy :
- (a) $1 < r < b$
(b) $0 < r \leq b$
(c) $0 \leq r < b$
(d) $0 < r < b$
2. $\pi - \frac{22}{7}$ is :
- (a) a rational number
(b) an irrational number
(c) a prime number
(d) an even number
3. If a, b, c are all non-zero and
 $a + b + c = 0$, then $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}$, is
equal to :
- (a) 3
(b) -3
(c) 9
(d) -9
4. If m and n are positive integers such
that $m^n = 32$, then the value of n^{mn} is :
- (a) 2^{10}
(b) 10^{32}
(c) 10^5
(d) 5^{10}

5. If $9 - 3 + \frac{1}{3} + 1 - x = 0$, then x is equal to :

(a) 19

(b) 9

(c) 3

(d) 1

6. Solve for x if $3^{x+1} + 3^{2-x} = \underline{3^3} + \underline{1}$:

(a) ~~-1, 2~~

(b) 1, -2

(c) -2, 3

(d) 2, -3

7. For what values of k does the pair of equations $x - 2y = 3$ and $3x + ky = 1$ have a unique solution ?

(a) $k = -6$

(b) $k \neq -6$

(c) $k = 0$ only

(d) $k \neq 0$ only

8. The pair of following equations

$$\frac{5}{x-1} + \frac{1}{y-2} = 2 \text{ and}$$

$$\frac{6}{x-1} - \frac{3}{y-2} = 1 \text{ will have a solution}$$

if $|x - y| = ?$

(a) 9

(b) 7

(c) 1

(d) 0

9. Naeem and Rajan play in the same soccer team. Last Sunday Rajan scored 3 more goals than Naeem but together they scored less than 9 goals. The possible number of goals Rajan scored is :

- (a) 0, 1 or 2
- (b) 3, 4 or 5
- (c) 6
- (d) 4, 5 or 6

10. 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 :

- (a) - 1
- (b) 0
- (c) 1
- (d) none of these

11. If $x + 2a$ is a factor of

$x^5 - 4a^2 x^3 + 2 x + 2 a + 3$, then the value of a is :

- (a) 3
- (b) - 3
- (c) $\frac{3}{2}$
- (d) $-\frac{3}{2}$

12. If the sum of first n terms of an A.P. is given by $S_n = 5n^2 + 3n$, then its n th term is :

- (a) $10n - 2$
- (b) $2n - 10$
- (c) $10n - 4$
- (d) $5n + 3$

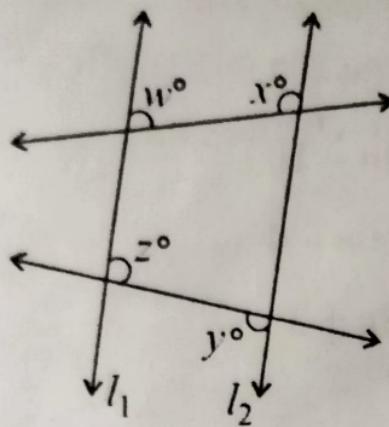
13. If the perpendicular distance of a point P from the x -axis is 5 units and the foot of the perpendicular lies on the negative direction of x -axis then the point P has :

- (a) x -coordinate = -5
- (b) y -coordinate = 5
- (c) y -coordinate = -5
- (d) y -coordinate = 5 or -5

14. In what ratio does the line $x - y - 2 = 0$ divide the line segment joining the points A(3, -1) and B(8, 9) ?

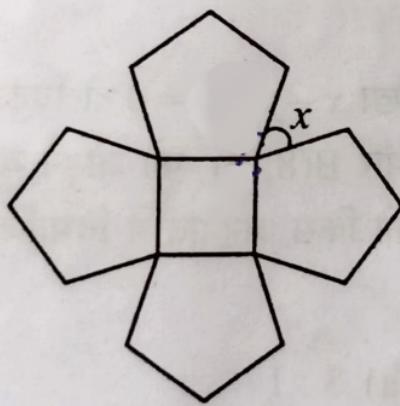
- (a) $3 : 1$
- (b) $1 : 3$
- (c) $3 : 2$
- (d) $2 : 3$

15. In the given figure if $l_1 \parallel l_2$, what is $x + y$ in terms of w and z ?



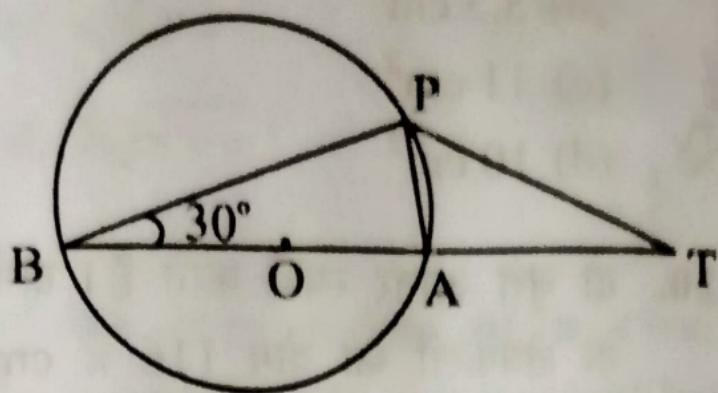
- (a) $180 - w + z$
(b) $180 + w - z$
(c) $180 - w - z$
(d) $180 + w + z$

16. The diagram shows a square and 4 regular pentagons. The value of angle marked x is :



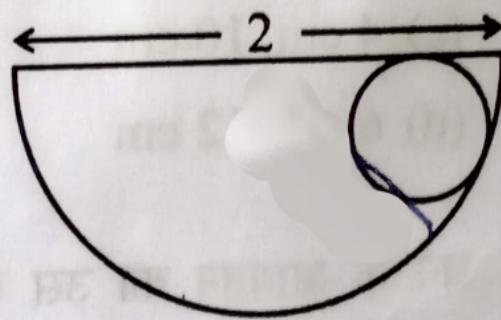
- (a) 36°
(b) 54°
(c) 72°
(d) can not be determined

17. In the given figure, O is the centre of a circle, BOA is its diameter and the tangent at the point P meets BA extended at T. If $\angle PBO = 30^\circ$, then find $\angle PTA$:



- (a) 60°
- (b) 30°
- (c) 15°
- (d) 45°

18. A circle is inscribed in a semi-circle of diameter 2 units as shown in figure. The radius of the inscribed circle may be :

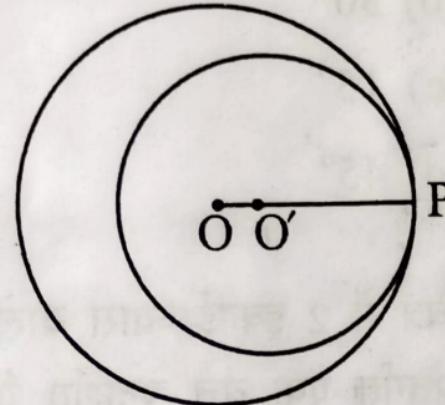


- (a) $\frac{(\sqrt{2} + 1)}{2}$
- (b) $\sqrt{2} - \frac{1}{2}$
- (c) $2\sqrt{2} - 1$
- (d) $\sqrt{2} - 1$

19. The hour hand of a clock is 6 cm long. The area swept by it between 11:20 a.m. and 11:55 a.m. is :

- (a) 2.75 cm^2
- (b) 5.5 cm^2
- (c) 11 cm^2
- (d) 10 cm^2

20. Two circles touch internally. The sum of their areas is $116\pi \text{ cm}^2$ and the distance between their centres is 6 cm. Find the radii of the circles :



- (a) 5 cm, 11 cm
- (b) 3 cm, 9 cm
- (c) 4 cm, 10 cm
- (d) 6 cm, 12 cm

21. Find the ratio of the volumes of a cube to that of a maximum size sphere which will exactly fit inside the cube :

- (a) $\pi : 4$
- (b) $6 : \pi$
- (c) $3 : \pi$
- (d) $27 : \pi$

22. If the areas of three adjacent faces of a cuboid are x , y and z respectively, then the volume of the cuboid is :

- (a) $x y z$
- (b) $2 x y z$
- (c) $\sqrt{x y z}$
- (d) $3 \sqrt{x y z}$

23. If the base radius of a cone is increased by 20% and its slant height is made double, then by how much per cent will the area of its curved surface be increased ?

- (a) 140%
- (b) 160%
- (c) 130%
- (d) 180%

24. $\sin^6 \theta + \cos^6 \theta + 3 \sin^2 \theta \cdot \cos^2 \theta = ?$

- (a) 1
- (b) 0
- (c) 3
- (d) 4

25. $\text{cosec}(65^\circ + \theta) - \sec(25^\circ - \theta) - \tan(55^\circ - \theta) + \cot(35^\circ + \theta)$ is equal to :

- (a) 1
- (b) 0
- (c) 2
- (d) 3

26. From the top of a cliff 25 m high the angle of elevation of a tower is found to be equal to the angle of depression of the foot of the tower. The height of the tower is :

- (a) 25 m
- (b) 50 m
- (c) 75 m
- (d) 100 m

27. A bar chart constructed in which area of each bar is proportional to the number of items of each group is known as :

- (a) pi-chart
- (b) histogram
- (c) frequency distribution chart
- (d) polygon

28. A pair of dice is thrown. The probability that either of the dice shows 2, when the sum of their face values is 6, is :

(a) $\frac{1}{5}$

(b) $\frac{2}{5}$

(c) $\frac{1}{2}$

(d) $\frac{3}{5}$

29. All the cards of Aces and Kings are removed from a pack of 52 cards.

One card is drawn from the remaining cards randomly. The probability of getting a Face card is :

(a) $\frac{2}{11}$

(b) $\frac{3}{11}$

(c) $\frac{2}{13}$

(d) $\frac{3}{13}$

30. The mean marks (out of 100) of boys and girls in an examination are 70 and 73 respectively. If the mean marks of all the students in that examination is 71, then the ratio of the number of boys to the number of girls is :

- (a) 2 : 1
- (b) 1 : 2
- (c) 1 : 3
- (d) 3 : 1

31. ‘Salwa Judum movement’ was associated with which Indian state ?

- (a) Punjab
- (b) Chhattisgarh
- (c) Jharkhand
- (d) West Bengal

32. The term ‘gambit’ is associated with :

- (a) Boxing
- (b) Chess
- (c) Wrestling
- (d) Billiards

33. Jataka literature is associated with -
- (a) Jainism
 - (b) Sikhism
 - (c) Buddhism
 - (d) Hinduism
34. Which of the following is the highest award in the field of literature in India ?
- (a) Sahitya Academy Award
 - (b) Vyas Samman
 - (c) Gyanpith Award
 - (d) Kalidas Samman
35. Khel Ratna Award is named after :
- (a) Dhyan Chand
 - (b) Rajiv Gandhi
 - (c) Arjuna
 - (d) Dronacharya
36. Fill in the blank with the most appropriate option :
Do you have an international driving _____ ?
- (a) licence
 - (b) license
 - (c) licensee
 - (d) licenci

37. The underlined word stands for :
‘The country is in a political
ferment.’

- (a) development
- (b) change
- (c) upheaval
- (d) influence

38. Which of the following combination
is incorrect ?

- (a) In accordance with
- (b) Apart from
- (c) Instead to
- (d) Due to

39. The underlined phrase stands for :
‘She phoned the hospital to ask after
her father.’

- (a) to call after somebody
- (b) to seek information about
- (c) to call abruptly
- (d) to show concern

40

Which one of the following is incorrect ?

- (a) It was rude of them to walk out.
- (b) You are responsible for this mess.
- (c) We sat by the roaring fire. —
- (d) I was upset for the decision.

41. The Qutub Minar was started to be

built by Qutubuddin Aibak but was finally completed by :

- (a) Razia Sultan
- (b) Iltutmish
- (c) Nasiruddin
- (d) Ruknuddin Firoz Shah

42. Original name of the Sultan Balban

was :

- (a) Wahid Khan
- (b) Sharif Khan
- (c) Ulugh Khan
- (d) Ghayas Khan

43. The officer whom Alauddin Khilji appointed as an incharge of each market was known as :

- (a) Shahna
- (b) Mukhiya
- (c) Amin
- (d) Munsif

44. Muhammad bin Tughlaq renamed which South Indian city as Daulatabad ?

- (a) Devadanam
- (b) Devaneri
- (c) Duranallur
- (d) Deogiri

45. Which Sultan was given the title of 'Lakh Baksh' ?

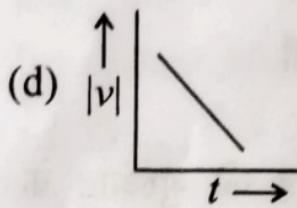
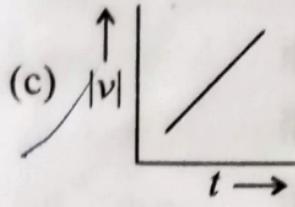
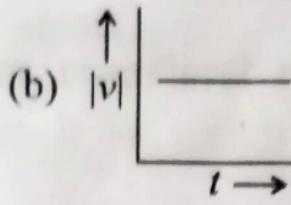
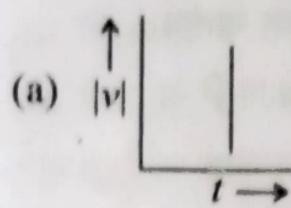
- (a) Qutubuddin Aibak
- (b) Alauddin Khilji
- (c) Iltutmish
- (d) Firoz Shah Tughlaq

46. Golgumbad is the final resting place of :

- (a) Muhammad Adil Shah
- (b) Ahmad Shah Abdali
- (c) Muhammad Qutub Shah
- (d) Shah Alam

- 47.** First Woman Chancellor of Aligarh Muslim University :
- (a) Professor Najma Akhtar
 - (b) Professor Naima Khatoon
 - (c) Begum Azizun Nisa
 - (d) Begum Sultan Jahan
- 48.** Aligarh Muslim University was established through the Act of the Parliament in the year :
- (a) 1920 AD
 - (b) 1926 AD
 - (c) 1950 AD
 - (d) 1981 AD
- 49.** In which place Sir Syed Ahmad Khan was posted at the outbreak of Revolt of 1857 ?
- (a) Ghazipur
 - (b) Moradabad
 - (c) Bijnor
 - (d) Aligarh
- 50.** Who among the following were not associated with MAO College, Aligarh ?
- (a) Sir Thomas Walker Arnold
 - (b) Shibli Numani
 - (c) Allama Iqbal
 - (d) Raja Jaikishan Das

51. A freely falling object is represented by which of the following v - t graph?



52. If two uniformly moving bodies travel along the same direction the distance between them reduces by 6 cm in 4 seconds, and if they travel towards each other then the distance between them reduces by 1 meter in 8 seconds. What is the ratio of the speeds with which they are travelling?

(a) 11 : 14

(b) 11 : 13

(c) 11 : 26

(d) 11 : 28

53. Which of the following type of motion does not require force ?
- (a) Uniform circular motion
 - (b) Motion in an elliptical path
 - (c) Projectile motion
 - (d) Uniform linear motion
54. A body of mass 100 gm attains a velocity of 20 ms^{-1} in 0.1s. The force acting on the body is :
- (a) 20000 N
 - (b) 20 N
 - (c) 200 N
 - (d) 2000 N
55. The percentage change of distance between two objects so that the gravitational force between them gets doubled is, approximately :
- (a) - 41%
 - (b) 41%
 - (c) - 30%
 - (d) 30%
56. Two bodies of mass 4 kg and 8 kg have same kinetic energy. The ratio of their linear momenta is :
- (a) 2 : 1
 - (b) 1 : 2
 - (c) 1 : $\sqrt{2}$
 - (d) $\sqrt{2} : 1$

57. The mass of an empty bucket of capacity 10 litres is 1 kg. The mass of the bucket, when it is completely filled with a liquid of relative density 0.8, will be :

- (a) 8 kg
- (b) 9 kg
- (c) 10 kg
- (d) 11 kg

58. If the speed of sound in air is 336 m/s then how far does sound travel in air when a tuning fork of frequency 560 Hz makes 30 vibrations ?

- (a) 9 m
- (b) 18 m
- (c) 27 m
- (d) 36 m

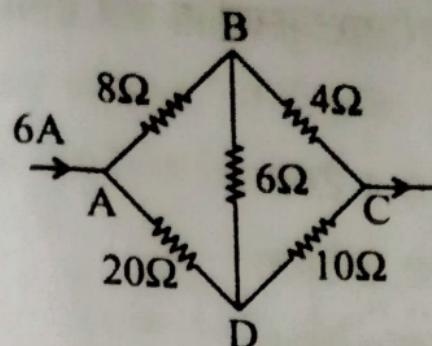
59. Sound waves :

- (a) Cannot propagate in steel.
- (b) Cannot propagate in vacuum.
- (c) Move faster than light waves.
- (d) Are not longitudinal in nature.

60. An electric bulb marked 40 W - 200 V is used in a circuit of supply voltage 100 V. Now its power will be :

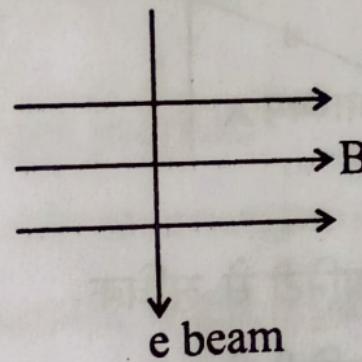
- (a) 100 W
- (b) 40 W
- (c) 20 W
- (d) 10 W

61. In the following figure, the current through 6Ω resistance is :



- (a) 1 A
- (b) 0 A
- (c) 2 A
- (d) 3 A

62. An electron beam enters a magnetic field at right angles to it as shown in figure :



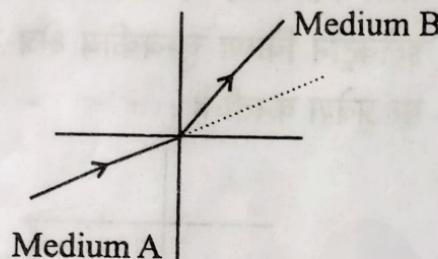
The direction of force acting on the electron beam will be :

- (a) to the left
- (b) to the right
- (c) into the page
- (d) out of the page

63. The magnetic field at a distance r from a long wire carrying current I is 0.4 tesla. The magnetic field at a distance $2r$ will be :

- (a) 0.1 tesla
- (b) 0.2 tesla
- (c) 0.8 tesla
- (d) 1.6 tesla

64. A light ray travels from medium A to medium B as shown in figure. The refractive index of medium A relative to B is :

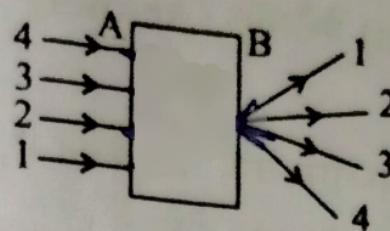


- (a) greater than unity
- (b) less than unity
- (c) equal to unity
- (d) zero

65. The focal length of a lens is 10 cm. What is the power of lens in dioptre ?

- (a) 0.1 D
- (b) 1 D
- (c) 10 D
- (d) 2 D

66. A beam of light is incident through the holes on side A and emerges out of the holes on the other face of the box as shown in figure. The object inside the box is :



- (a) Concave lens
 - (b) Glass slab (square)
 - (c) Prism
 - (d) Convex lens
67. Which of the following conditions is necessary for the production of biogas ?
- (a) Oxygen presence
 - (b) Aerobic microorganism activity
 - (c) Anaerobic microorganism action
 - (d) Presence of fertilizers

68. L Gel is a colloidal solution in which the dispersed phase and dispersion medium are respectively :
- (a) Liquid and solid
 - (b) Solid and liquid
 - (c) Gas and solid
 - (d) Gas and liquid

69. Butter is an example of :

- (a) Sol
- (b) Foam
- (c) Gel
- (d) Aerosol

70. It is called acid rain, when pH of rain water is :

- (a) less than 2.5
- (b) less than 4.5
- (c) less than 5.6
- (d) more than 7

71. If pH of solution changes from 4 to 1, then the change in hydrogen ion concentration shall be :

- (a) 3 times
- (b) 10 times
- (c) 100 times
- (d) 1000 times

72. The mass of 0.4 moles of Nitrogen gas is :

- (a) 11.2 g
- (b) 6 g
- (c) 14 g
- (d) 28 g

73. The pH at which tooth decay starts is :

(a) more than 7

(b) 8

(c) less than 5.5

(d) 5.5 - 7

74. Ant sting has which acid ?

(a) Citric acid

(b) Methanoic acid

(c) Tartaric acid

(d) Acetic acid

75. Conversion of ethanol to ethanoic acid is an :

(a) Oxidation Reaction

(b) Reduction Reaction

(c) Redox Reaction

(d) Photocatalytic Reaction

76. When ethanol is heated at 443K with excess of concentrated sulphuric acid, the product formed will be :

(a) Ethene

(b) Propene

(c) Ethane

(d) Propane

77. The catalyst which leads to the unsaturated hydrocarbons to be converted into saturated hydrocarbons :

- (a) Iron
- (b) Manganese
- (c) Chromium
- (d) Palladium

78. Burning of a natural gas is an example of :

- (a) Combination reaction
- (b) Decomposition reaction
- (c) Displacement reaction
- (d) Double-displacement reaction

79. Chemical formula for marble is :

- (a) $\text{Ca}(\text{OH})_2$
- (b) CaO
- (c) CaCO_3
- (d) CaCl_2

80. Which elements are present in Baking powder ?

- (a) Sodium, Hydrogen and Carbon
- (b) Sodium, Oxygen and Carbon
- (c) Hydrogen, Oxygen and Carbon
- (d) Sodium, Hydrogen, Carbon and Oxygen

81. What are the products of decomposition of Lead Nitrate?

(a) Lead oxide and Nitrogen trioxide

(b) Lead oxide, Nitrogen dioxide and Oxygen

(c) Lead oxide, Nitrous oxide and Oxygen

(d) Lead oxide, Nitric oxide and Oxygen

82. Antioxidants are added to food to prevent _____ of fat/oils.

(a) reduction

(b) decomposition

(c) oxidation

(d) fermentation

83. Germanium is a :

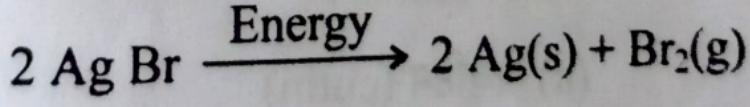
(a) Metal

(b) Non-metal

(c) Metalloid

(d) Inert gas

84. In the following reaction, which form of energy is used?



(a) Electricity

(b) Sun light

(c) Heat

(d) Both, (a) and (c)

85. Nitrogen is a part of many molecules, essential to life, except :

- (a) Proteins
- (b) Vitamins
- (c) Nucleic acids
- (d) Carbohydrates

86. The information source for proteins synthesis in the cell, is cellular

- (a) ATP
- (b) ADP
- (c) RNA
- (d) DNA

*RR + MY
Round yellow*

87. If a pea plant with green, round seeds is crossed with a yellow, wrinkled seeds, then in F₁ progeny, the seeds will be :

- (a) Green, round
- (b) Yellow, wrinkled
- (c) Yellow, round
- (d) Green, wrinkled

88. The cells of cork have a chemical called :

- (a) cutin
- (b) suberin
- (c) wax
- (d) lignin

89. *Bryophyllum* can be propagated by :

- (a) Seeds
- (b) Stem cuttings
- (c) Leaf buds
- (d) Root cuttings

90. Which one of the following plant hormones promote cell division ?

- (a) Abscisic acid
- (b) Gibberellin
- (c) Auxin
- (d) Cytokinin

91. During night, major exchange activity occurring in the plants is :

- (a) O₂ elimination
- (b) CO elimination
- (c) CO₂ elimination
- (d) NO elimination

92. In C₃ plants photosynthesis occurs in :

- (a) Thylakoids
- (b) Only Mesophyll cells
- (c) Only bundle sheath
- (d) Both, Mesophyll cells and bundle sheath

93. Which of the following is not a marine fish ?

- (a) Pearl spot
- (b) Bombay duck
- (c) Mrigals
- (d) Tuna

94. Homologous organs have :

- (a) same structure and same function
- (b) different structure and different function
- (c) different structure but same function
- (d) same structure but different function

95. The action of adrenaline and noradrenaline hormones is :

- (a) Synergetic
- (b) Cumulative
- (c) Additive
- (d) Antagonistic

96. What is common between Malaria and Japanese Encephalitis ?

- (a) Housefly
- (b) Droplet infection
- (c) Mosquito
- (d) Contaminated food

97. The gap between two neurons is called :

- (a) Dendrites
- (b) Synapse
- (c) Axon
- (d) Impulse

98. Life originated from simple inorganic substances was the finding of :

- (a) Darwin
- (b) Mendel
- (c) Haldane
- (d) Miller

99. Which part of the brain maintains Posture and equilibrium ?

- (a) Medula
- (b) Cerebrum
- (c) Cerebellum
- (d) Spinal cord

100. Which of the following is a viral disease and is transmitted by mosquitoes ?

- (a) Sleeping sickness
- (b) AIDS
- (c) Japanese encephalitis
- (d) Typhoid