Monthly Progressive Test

Class: X

Subject: PCMB

Test Booklet No.: MPT-04

Test Date: 3 0 1 0 2 0 2 5

Time: 120 mins

Full Marks: 200

Important Instructions :

1. The Test is of 120 mins duration and the Test Booklet contains 100 multiple choice questions of single correct option only. There are four sections with four subjects. You have to attempt all 100 questions (Candidates are advised to read all 100 questions). Questions 1 to 25 contain Physics, Questions 26 to 50 contain Chemistry, Questions 51 to 75 contain Mathematics, Questions 76 to 100 contain Biology.

2. Each question carries 2 marks. For each correct response, the candidate will get 2 marks. There is no negative mark for wrong response. The maximum mark is 200.

3. Use Blue / Black Ball point Pen only for writing particulars marking responses on Answer Sheet.

4. Rough work is to be done in the space provided for this purpose in the Test Booklet only.

5. On completion of the test, the candidate must handover the Answer Sheet to the invigilator before leaving the Room / Hall. The candidates are allowed to take away this Test Booklet with them.

6. The CODE for this Booklet is Off Line   MPT04 30102025.

7. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your UID No. anywhere else except in the specified space. Use of white fluid for correction is NOT permissible on the Answer Sheet. **Do not scrible or write on or beyond discrete bars of OMR Sheet at both sides**.

8. Each candidate must show on-demand his/her Registration document to the Invigilator.

9. No candidate, without special permission of the Centre Superintendent or Invigilator, would leave his/her seat.

10. Use of Electronic Calculator/Cellphone is prohibited.

11. The candidates are governed by all Rules and Regulations of the examination with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per Rules and Regulations of this examination.

12. No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.

13. There is no scope for altering response mark in Answer Sheet.

Physics

1. A concave mirror produces a real image 20 cm from the mirror when the object is 15 cm in front of it. Find the focal length.

    Ⓐ 6 cm   Ⓑ 8.5 cm   Ⓒ 12 cm   Ⓓ 9 cm

2. The image formed by a convex lens is three times the size of the object and is real. If the image is 60 cm from the lens, find the focal length.

    Ⓐ 10 cm   Ⓑ 15 cm   Ⓒ 20 cm   Ⓓ 25 cm

3. A glass slab of thickness 4 cm and refractive index 1.5 is placed in air. The lateral displacement of a ray making an angle of 45° is approximately—

    Ⓐ 1.2 cm   Ⓑ 1.5 cm   Ⓒ 2.8 cm   Ⓓ 3.5 cm

4. A circuit has a current of 0.5 A flowing through a resistor of 8 Ω. Find the power consumed.

    Ⓐ 1 W   Ⓑ 2 W   Ⓒ 4 W   Ⓓ 8 W

5. A current of 3 A flows through a 6 Ω resistor for 5 minutes. Calculate the total heat produced.

    Ⓐ 5400 J   Ⓑ 16200 J   Ⓒ 4500 J   Ⓓ 540 J

6. The potential difference across a resistor is doubled. What happens to the power dissipated?

    Ⓐ Halved   Ⓑ Doubled   Ⓒ Tripled   Ⓓ Quadrupled

7. Find the resistance of a conductor if a current of 2.5 A flows when a potential difference of 10 V is applied

    Ⓐ 2 Ω   Ⓑ 3 Ω   Ⓒ 4 Ω   Ⓓ 5 Ω

8. A current of 2 A flows through a wire for 300 seconds. Calculate the charge passing.

    Ⓐ 150 C   Ⓑ 300 C   Ⓒ 450 C   Ⓓ 600 C

9. The resistance of a wire is 5 Ω. It is drawn out to double its length. Find its new resistance.

    Ⓐ 10 Ω   Ⓑ 15 Ω   Ⓒ 20 Ω   Ⓓ 25 Ω

10. A 60 W bulb and 100 W bulb are connected in parallel to a 220 V supply. Which bulb draws more current?

    Ⓐ 60 W   Ⓑ 100 W

    Ⓒ Both equal   Ⓓ Depends on connection

11. A convex lens of focal length 12 cm produces an image 18 cm from the lens. Find the object distance.

    Ⓐ 18 cm   Ⓑ 24 cm   Ⓒ 36 cm   Ⓓ 9 cm

12. The current through a 3 Ω resistor is 2 A. Find the power dissipated in it.

    Ⓐ 6 W   Ⓑ 9 W   Ⓒ 12 W   Ⓓ 18 W

13. The magnetic field at the center of a circular coil of radius 5 cm with 100 turns carrying 2 A current is—

    $(\mu = 4\pi \times 10^{-7}\ T\ ^m/_A)$

    Ⓐ $2.5 \times 10n^3$ T   Ⓑ $4 \times 10n^3$ T   Ⓒ $6.28 \times 10n^3$ T   Ⓓ $1.26 \times 10n^2$ T

14. A straight conductor of length 0.5 m carrying a current of 3 A is placed in a magnetic field of 0.4 T perpendicular to it. Find the force.

Ⓐ 0.3 N   Ⓑ 0.4 N   Ⓒ 0.6 N   Ⓓ 0.8 N

15. The resistance of a lamp filament is 240 Ω. What current will flow when it is connected to a 120 V supply?

Ⓐ 0.25 A   Ⓑ 0.5 A   Ⓒ 1 A   Ⓓ 2 A

Assertion-Reason (Q. No. 16 — Q. No. 19)

Read the two statements carefully and select the correct option given below.

A: Assertion and Reason both are correct and Reason is the correct explanation of Assertion

B: Assertion and Reason both are correct and Reason is not the correct explanation of Assertion

C: Assertion is correct but Reason is wrong

D: Assertion is wrong but Reason is correct

16. **Assertion (A):** A concave mirror can form both real and virtual images.
Reason (R): The nature of the image formed by a concave mirror depends on the position of the object with respect to the mirror.

Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

17. **Assertion (A):** The refractive index of a medium is always greater than one.
Reason (R): The speed of light in any medium is less than the speed of light in vacuum.

Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

18. **Assertion (A):** A current-carrying conductor produces a magnetic field around it.
Reason (R): Moving electric charges produce a magnetic field.

Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

19. **Assertion (A):** The direction of magnetic field around a straight current-carrying conductor can be determined using the right-hand thumb rule.
Reason (R): The direction of the magnetic field is given by curling the fingers of the right hand around the conductor with the thumb pointing in the direction of current.

Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

Case-Based Questions (2 Cases × 3 Questions Each)

Case 1: Refraction through Lens

A student performs an experiment using a convex lens of focal length 15 cm to obtain a sharp image of a distant tree on the screen.

20. If the image is formed at 20 cm from the lens, where is the object placed?

Ⓐ 20 cm   Ⓑ 30 cm   Ⓒ 60 cm   Ⓓ Infinity

21. What is the nature of the image formed?

Ⓐ Real and inverted   Ⓑ Virtual and erect   Ⓒ Diminished   Ⓓ On the same side

22. If the object is now placed at 10 cm from the lens, what will be the nature of the image?

Ⓐ Real and inverted   Ⓑ Virtual and erect   Ⓒ Diminished   Ⓓ On the screen

Case 2: Magnetic Field and Electric Motor

A rectangular coil of wire carrying current is placed in a magnetic field. The coil experiences a force and starts rotating, forming the basic principle of an electric motor.

23. The direction of rotation of the coil can be determined by—

    Ⓐ Fleming's right-hand rule   Ⓑ Fleming's left-hand rule

    Ⓒ Right-hand thumb rule   Ⓓ Lenz's law

24. If the current in the coil is doubled, how does the torque on it change?

    Ⓐ Remains same   Ⓑ Doubles   Ⓒ Triples   Ⓓ Becomes four times

25. The magnetic field in the motor is produced by—

    Ⓐ Permanent magnets   Ⓑ Electromagnet

    Ⓒ Both   Ⓓ none of these

Chemistry

26. The number of carbon atoms surrounding each atom in a diamond are :

    Ⓐ 3   Ⓑ 4   Ⓒ 2   Ⓓ 5

27. Ethanol is reacting with sodium metal and select the correct statements :

   (I) There is only one bond in the produced gaseous compound.

   (II) The salt produced in this reaction is same when a salt produced during the reaction between ethanoic and sodium hydroxide.

   (III) Ethanol and sodium metal is a reducing agent.

    Ⓐ (I), (II), (III)   Ⓑ (I), (II)   Ⓒ (II), (III)   Ⓓ (I), (III)

28. What happens when silver chloride is exposed to sunlight?

    Ⓐ Black coloured silver is produced along with Cl_2 gas

    Ⓑ Black coloured silver oxide is produced along with Cl_2 gas

    Ⓒ Grey coloured silver oxide is produced along with Cl_2 gas

    Ⓓ Grey coloured silver is produced along with Cl_2

29. When calcium comes contact with water then it starts floating. Because

    Ⓐ Density of the metal starts decreasing   Ⓑ The metal becomes lighter

    Ⓒ The produced gas sticks to the metal   Ⓓ Calcium hydroxide is formed

30. In covalent molecules which is/are correct :

    Ⓐ Low melting point and boiling point   Ⓑ Bad conductors of electricity

    Ⓒ Insoluble in polar solvent   Ⓓ All of these

31. Which is incorrect?

    Ⓐ Diamond is a good conductor of electricity   Ⓑ Fullerene has a molecular formula C_{60}

    Ⓒ Graphite is a good conductor of heat   Ⓓ CCl_4 acts as a solvent

32. In which of the following option, both are unsaturated hydrocarbons?

    Ⓐ C_2H_6 & C_2H_2 Ⓑ C_2H_4 & C_4H_{10}

    Ⓒ C_3H_6 & C_2H_2 Ⓓ C_3H_6 & C_4H_{10}

33. Ethanol and dimethyl ether are which type of isomers?

   Ⓐ Chain isomer
   Ⓑ Position isomers
   Ⓒ Functional group isomers
   Ⓓ Metameres

34. Which component is being reduced in the given reaction?

   $CuO + H_2 \xrightarrow{\Delta} Cu + H_2O$

   Ⓐ H_2O
   Ⓑ Cu
   Ⓒ H_2
   Ⓓ CuO

35. Which of the following is the major constituent of the liquefied petroleum gas?

   Ⓐ methane
   Ⓑ propane
   Ⓒ ethane
   Ⓓ butane

Assertion-Reason Based Questions

   Read the two statements carefully and select the correct option given below.

   A: Assertion and Reason both are correct and Reason is the correct explanation of Assertion

   B: Assertion and Reason both are correct and Reason is not the correct explanation of Assertion

   C: Assertion is correct but Reason is wrong

   D: Assertion is wrong but Reason is correct

36. **Assertion (A):** Zn can release H_2 gas from dilute H_2SO_4 but Cu can not.

   Reason (R): In activity series Zn is placed higher than hydrogen and Cu is placed lower.

   Ⓐ A
   Ⓑ B
   Ⓒ C
   Ⓓ D

37. **Assertion (A):** NaCl has higher melting point than CCl_4.

   Reason (R): NaCl is soluble in water.

   Ⓐ A
   Ⓑ B
   Ⓒ C
   Ⓓ D

38. **Assertion (A):** Atomic number is more fundamental property than atomic weight.

   Reason (R): Atomic number deals with the number of electrons which is responsible for the chemical properties of the elements.

   Ⓐ A
   Ⓑ B
   Ⓒ C
   Ⓓ D

39. **Assertion (A):** Ionic compounds generally have high melting points & high lattice energy.

   Reason (R): It is because they are ionic in nature and forms a very stable crystal.

   Ⓐ A
   Ⓑ B
   Ⓒ C
   Ⓓ D

40. The percentage of ethyl alcohol in rectified spirit is :

   Ⓐ 70
   Ⓑ 50
   Ⓒ 95
   Ⓓ 90

41. The I.U.P.A.C name of CH_3CH_2CHO is

   Ⓐ propanaldehyde
   Ⓑ ethyl aldehyde
   Ⓒ propanol
   Ⓓ propanal

42. The IUPAC name of $(CH_3)_2CHCOOH$ is :

   Ⓐ Prapane-2-oic acid
   Ⓑ isobutanoic acid
   Ⓒ 2-methylpropanoic acid
   Ⓓ 2-methyl butanoic acid

43. The three members of homologous series are : C_3H_4, C_4H_6 and C_5H_8 which of the following compounds belongs to above homologous series?

Ⓐ C_6H_{14}　　　　Ⓑ C_8H_6　　　　Ⓒ C_2H_4　　　　Ⓓ C_2H_2

44. 1 mole of ethene and 1 mole of ethyne are subjected to hydrogenation in presence of nickel catalyst. Both these compounds form saturated compounds. Which of the following will be different for the above mentioned two reactions?

P : Both ethene and ethyne will give same number of saturated compounds.

Q : Both ethene and ethyne consume same number of moles of hydrogen.

Ⓐ only P　　　　Ⓑ only Q　　　　Ⓒ both P & Q　　　　Ⓓ neither P nor Q

Case Based Type Questions (Q. No. 45–47)

An ionic compound is a chemical compound in which ions of elements are held together by ionic bonds. In this type of bond, two oppositely charged ions are held strongly through electrostatic forces. Metals have loosely bound electrons in their valence shell whereas *n*-th metals need electrons for octet. Completion and to attain noble gas configuration. The metal thus completely loses an electron and the non-metal accepts it. By this transfer of electrons, the atoms remain no longer natural. Cations and anions are formed respectively usually ionic compounds are solids and formed in the form of crystals. They have high melting & boiling point.

45. Ionic compounds are soluble in which of the following?

Ⓐ petrol　　　　Ⓑ water　　　　Ⓒ kerosene　　　　Ⓓ edible oil

46. Consider these statements about ionic compound

   I. They conduct electricity in solid state.

  II. The conduct electricity in solutions.

  III. The conduct electricity in the molten state.

Choose the correct option :

Ⓐ I only　　　　Ⓑ III only　　　　Ⓒ II only　　　　Ⓓ II & III only

47. Which of the following is/are ionic compound?

Ⓐ NaCl　　　　Ⓑ Al_2O_3　　　　Ⓒ $AlCl_3$　　　　Ⓓ both Ⓐ & Ⓑ

Case Based Type Questions (Q. No. 48–50)

All metals do not react with oxygen at the same rate. Different metals show different reactivities based on the activity series of meals. Metallic oxides are bases. Water soluble bases are called alkali. All alkali are bases but all bases are not alkali.

48. Arrange the metals in the correct order of their reactivity :

Ⓐ Mg > Al > Zn > Fe　　　　　　　　Ⓑ Al > Mg > Fe > Zn

Ⓒ Mg > Zn > Al > Fe　　　　　　　　Ⓓ Al > Fe > Zn > Mg

49. Why does the magnesium ribbon need to be cleaned before burning it in air?

Ⓐ To increase its efficiency　　　　　　Ⓑ To remove the oxide layer from it

Ⓒ To decrease its efficiency　　　　　　Ⓓ All of the above

50. Which of the following is an alkali?

Ⓐ MnO_2　　　　Ⓑ CuO　　　　Ⓒ NaCl　　　　Ⓓ KOH

Mathematics

**51.** Let PQ = 24 cm and PR = 7 cm. Calculate the area of shaded region.
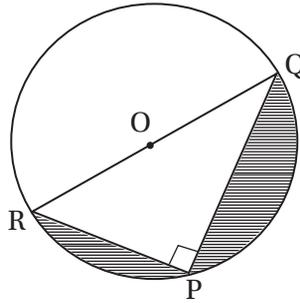
   Ⓐ 161.54 cm^2 Ⓑ 151.31 cm^2 Ⓒ 121.31 cm^2 Ⓓ 181.31 cm^2

52. A chord of a circle of radius 20 cm subtends an angle of 90° at the centre. Find the area of the corresponding major segment of the circle. (use π = 3.14)

   Ⓐ 1245.5 cm^2 Ⓑ 1155.5 cm^2 Ⓒ 1142 cm^2 Ⓓ None of these

53. In the figure given below, ABCD is a square with each side measuring 7 cm and a circle is inscribed in the square.
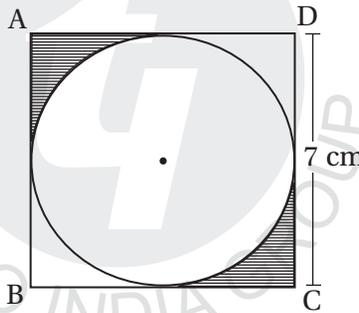

What is the total area of the shaded region ?

   Ⓐ 5.25 cm^2 Ⓑ 6.25 cm^2 Ⓒ 7.54 cm^2 Ⓓ 9.6 cm^2

54. In a quadrilateral park, two opposite sides having length 42 m and 48 m, are parallel and the distance between them is 18 m. If on all the corners of the park, arcs of the same radius, i.e. 3.5 m, are cut and areas enclosed within the arcs are kept without grass to make refreshment corners in the park, then what will be the area of the park which is covered by grass? $\left[\text{Take } \pi = \dfrac{22}{7} \right]$

   Ⓐ 761.5 m^2 Ⓑ 770 m^2 Ⓒ 771.5 m^2 Ⓓ 772 m^2

55. In the given figure, a circle is drawn with B as the centre and AC as the diameter; two semicircles are drawn with AB and BC as diameters. If the perimeter of the shaded portion is 280 cm, what will be the radius of the semicircle whose diameter is AB ?
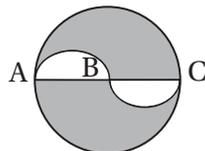
   Ⓐ 22 cm   Ⓑ 14.5 cm   Ⓒ 12.25 cm   Ⓓ 8 cm

Case Study Based Question-I (Q. 56 to Q. 58)

In an annual day function of a school, the organizers wanted to give a cash prize along with a memento to their best students. Each memento is made as shown in the figure and its base ABCD is shown from the front side. The rate of silver plating is ₹ 20 per cm^2 .
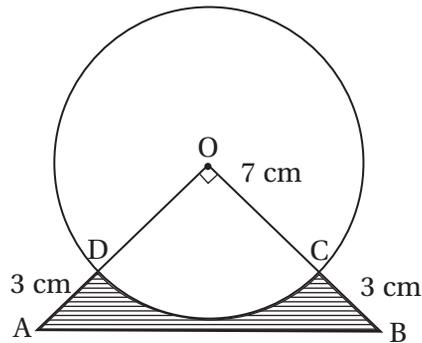
On basis of this information given in passage answer following questions.

56. What is the area of the quadrant ODCO ?

Ⓐ 39 cm^2 Ⓑ 38.5 cm^2 Ⓒ 37.5 cm^2 Ⓓ 40 cm^2
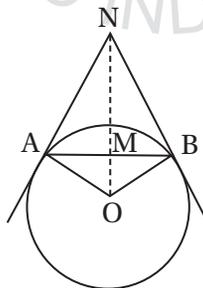
57. Find the area of △ AOB.

Ⓐ 49 cm^2 Ⓑ 38.5 cm^2 Ⓒ 37.5 cm^2 Ⓓ 50 cm^2

58. What is the total cost of silver plating the shaded part ABCD?

Ⓐ ₹ 240   Ⓑ ₹ 230   Ⓒ ₹ 220   Ⓓ ₹ 225

Case Study Based Question-II (Q. 59 to Q. 61)

Circles play an important part in our life. When a circular object is hung on the wall with a chord at nail N, the chords NA and NB work like tangents. Observe the figure, given that ∠ANO = 30° and OA = 5 cm.

On basis of the above information answer the following questions.

59. Find the length of AN

Ⓐ $5\sqrt{3}$ cm   Ⓑ $5\sqrt{2}$ cm   Ⓒ 5 cm   Ⓓ 6 cm

60. Find the measure of ∠AOB.

Ⓐ 60°   Ⓑ 50°   Ⓒ 110°   Ⓓ 120°

61. Find the total length of chords NA, NB and the chord AB.

Ⓐ $10\sqrt{3}$ cm   Ⓑ $15\sqrt{3}$ cm   Ⓒ $5\sqrt{2}$ cm   Ⓓ $15\sqrt{2}$ cm

Assertion and Reason Based Questions (Q. 62 – Q. 65) :

Directions: In each of the questions given below, there are two statements marked as Assertion (A) and Reason (R). Mark your answer as per the codes provided below :
    a. Both A and R are true and R is the correct explanation of A.
    b. Both A and R are true but R is not the correct explanation of A.
    c. A is true but R is false.
    d. A is false but R is true.

62. **Assertion (A) :** $\sin(A + B) = \sin A + \sin B$

    Reason (R) : For any value of θ, $1 + \tan^2\theta = \sec^2\theta$ where $\theta \neq (2n+1)\dfrac{\pi}{2}$; $n \in I$

    Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

63. **Assertion (A) :** In the $\triangle ABC$, AB = 24 cm, BC = 10 cm and AC = 26 cm, Then, $\triangle ABC$ is a right-angle triangle.
    Reason (R) : If in two triangles, their corresponding angles are equal, then the triangles are similar.

    Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

64. **Assertion (A) :** Let the positive numbers a, b, c be in A.P., then $\dfrac{1}{bc}, \dfrac{1}{ac}, \dfrac{1}{ba}$ are also in A.P.

    Reason (R) : If each term of an A.P. is divided by abc, then the resulting sequence is also in A.P.

    Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

65. **Assertion (A) :** If one zero of polynomial $p(x) = (k^2 + 4)x^2 + 13x + 4k$ is reciprocal of the other, then $k = 2$.
    Reason (R) : If $(x - a)$ is a factor of $p(x)$, then $p(a) = 0$ i.e., a is a zero of $p(x)$.
    Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

66. A number on dividing by 13 gives remainder 3 and on dividing the same number by 21 gives remainder 11. If the number lies between 500 and 600, then the remainder on dividing the same number by 19 is
    Ⓐ 6   Ⓑ 4   Ⓒ 5   Ⓓ 2

67. If $a_1, a_2, a_3 \ldots\ldots\ldots\ldots an$ are in AP where $a_i > 0$ for all i then the value of

$$\frac{1}{\sqrt{a_1}+\sqrt{a_2}} + \frac{1}{\sqrt{a_2}+\sqrt{a_3}} + \ldots\ldots + \frac{1}{\sqrt{a_{n-1}}+\sqrt{a_n}}$$

    Ⓐ $\dfrac{1}{\sqrt{a_1}+\sqrt{a_n}}$ Ⓑ $\dfrac{1}{\sqrt{a_1}-\sqrt{a_n}}$ Ⓒ $\dfrac{n}{\sqrt{a_1}-\sqrt{a_n}}$ Ⓓ $\dfrac{n-1}{\sqrt{a_1}+\sqrt{a_n}}$

68. The coordinates of the centre of a circle passing through (1, 2), (3, –4) and (5, –6) is _____ .
    Ⓐ (– 11, – 2)   Ⓑ (2, 11)   Ⓒ (11, 2)   Ⓓ (–2, 11)

69. Given $A = \sin^2 x + \cos^4 x$, then for all real values of x.
    Ⓐ $1 \leq A \leq 2$ Ⓑ $\dfrac{3}{4} \leq A \leq 1$ Ⓒ $\dfrac{13}{16} \leq A \leq 1$ Ⓓ $\dfrac{3}{4} \leq A \leq \dfrac{13}{16}$

70. From a light house the angles of depression of two ships on opposite sides of the light house are observed to be 30° and 45°. If the height of the light house is h metres then the distance between the ships is

    Ⓐ $\left(\sqrt{3}+1\right)$ h m   Ⓑ $\left(\sqrt{3}-1\right)$ h m   Ⓒ $\sqrt{3}$ h m   Ⓓ $\left(1+\dfrac{1}{\sqrt{3}}\right)$ h m

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71. A circle with centre 'O' has been inscribed in an isosceles triangle PQR such that PQ = PR = 17 cm and QR = 16 cm then radius of the circle is
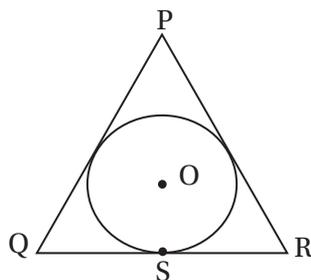
Ⓒ 8 cm   Ⓓ 6 cm   Ⓔ 4.8 cm   Ⓕ 8.5 cm

72. The value of m for which the equation $\dfrac{a}{x+a+m}+\dfrac{b}{x+b+m}=1$ has roots equal in magnitude but opposite in sign is

Ⓒ $\dfrac{a+b}{a-b}$ Ⓓ 0   Ⓔ $\dfrac{a-b}{a+b}$ Ⓕ $\dfrac{2(a-b)}{a+b}$

73. If from an external point P of a circle with centre O, two tangents PQ and PR are drawn such that $\angle$QPR = 60°, then

Ⓒ $PQ=\sqrt{3}\,PO$ Ⓓ $2PQ=\sqrt{3}\,PO$ Ⓔ $\sqrt{3}\,PQ=PO$ Ⓕ $\sqrt{3}\,PQ=2PO$

74. If a_1, a_2, ..., a_{19} are the first 19 terms of an AP and $a_1 + a_8 + a_{12} + a_{19} = 224$. Then $\sum\limits_{i=1}^{19} a_i$ is equal to

Ⓒ 896   Ⓓ 1064   Ⓔ 1120   Ⓕ 1164

75. Find a and b for which (a – 1) x + 3y = 2, 6x + (1 – 2b) y = 6 have infinite number of solutions.

Ⓒ a = – 7, b = – 4   Ⓓ a = – 1, b = – 4   Ⓔ a = 3, b = – 1   Ⓕ a = 3, b = – 4

Biology

76. What is the unit of heredity?
Ⓒ Cell   Ⓓ Nucleus   Ⓔ Chromosome   Ⓕ None of the above

77. 'Trait' refers to
Ⓒ Genetic mutations   Ⓓ Offsprings of two different species
Ⓔ Expression of a character in an organism   Ⓕ Any character

78. In pea,
Ⓒ violet flowers are dominant over white flowers   Ⓓ white flowers are dominant over violet flowers
Ⓔ round seeds are dominant over oval seeds   Ⓕ white flowers are not produced

79. What is the genotype of a tall pea plant?
Ⓒ TT or tt   Ⓓ tt or Tt   Ⓔ TT or Tt   Ⓕ Only TT

80. What is the typical number of chromosome in a human somatic cell?
Ⓒ 23   Ⓓ 23 pairs   Ⓔ 48   Ⓕ 24 pairs

81. Haploid cells are:
   Ⓐ Bone cells   Ⓑ Germ cells   Ⓒ Fat cells   Ⓓ Cells of ovary

82. Select the genotype of a homozygous dominant individual?
   Ⓐ Aa   Ⓑ aa   Ⓒ Ab   Ⓓ AA

83. In pea, rrYY stands for _____ seeds.
   Ⓐ round and yellow   Ⓑ round and green   Ⓒ wrinkled and yellow   Ⓓ wrinkled and green

84. A trait in an organism is influenced by:
   Ⓐ Maternal DNA   Ⓑ Paternal DNA
   Ⓒ Both maternal and paternal DNA   Ⓓ Neither maternal nor paternal DNA

85. How many pairs of characters were studied by Mendel for his experiments on Heredity?
   Ⓐ 7   Ⓑ 14   Ⓒ 23   Ⓓ 20

86. A Mendelian experiment consisted of breeding tall pea plants bearing violet flowers with short pea plants bearing white flowers. The progeny all bore violet flowers , but almost half of them were short. Thus the genetic make up of the tall parent is
   Ⓐ TTWW   Ⓑ TTww   Ⓒ TtWW   Ⓓ TtWw

87. A homozygous dominant guinea pig with black fur is crossed with a homozygous recessive guinea pig with white fur. The F1 generation is crossed with itself. What percentage of F2 generation is expected to show white fur coat?
   Ⓐ 25%   Ⓑ 50%   Ⓒ 75%   Ⓓ 100%

88. Human males are:
   Ⓐ Heterogenetic   Ⓑ Heterogametic
   Ⓒ Homogametic   Ⓓ Both B and C

89. Male sex of the offspring is decided by:
   Ⓐ Presence of X chromosome in the egg   Ⓑ Presence of X chromosome in the sperm
   Ⓒ Presence of Y chromosome in the sperm   Ⓓ Absence of both X and Y chromosomes in the sperm

90. How many X chromosomes will be there in a zygote destined to be a girl child?
   Ⓐ 1   Ⓑ 2   Ⓒ 3   Ⓓ 0

Assertion and Reason Based Questions :

Directions: The questions 91 to 94 have two statements – Assertion (A) and Reason (R). Of the two statements, mark the correct answer from the options given below:

   A: Both A and R are true and R is the correct explanation of A.
   B: Both A and R are true but R is not the correct explanation of A.
   C: A is true but R is false.
   D: A is false but R is true

91. **Assertion (A) :** Genetic variation is advantageous to a population.

   Reason (R) : Genetic variations enable better adaptation to the environment.

   Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

92. **Assertion (A):** 3:1 is the genotypic ratio of monohybrid cross.

   Reason (R): 3 represents tall plants and 1 stands for dwarf plants phenotypically

   Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

93. **Assertion (A):** Pea plants produce a large number of seeds in one generation.
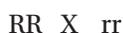
   Reason (R): The pea flowers are self pollinating.

   Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

94. **Assertion (A):** In humans, the statistical probability of getting either a male or a female child is 50:50.

   Reason (R): The ratio of sperms containing X chromosome and those containing Y chromosome is 50:50.

   Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

Consider the given cross and answer the following questions (95-97)

RR X rr

95. The gametes produced by both the parents will be _____, respectively.

   Ⓐ RR and rr   Ⓑ rr and RR   Ⓒ Rr and Rr   Ⓓ R and r

96. The genotype of the FI individuals will be:

   Ⓐ Round   Ⓑ Wrinkled

   Ⓒ Half round and half wrinkled   Ⓓ None of the above

97. The F2 progeny will be in the genotypic ratio:

   Ⓐ 3 round : 1 wrinkled   Ⓑ 3 wrinkled : 1 round

   Ⓒ 1pure round : 2 hybrid round : 1 pure wrinkled   Ⓓ 1 pure round : 2 hybrid wrinkled : 1 pure wrinkled

Read the given passage and answer the following questions (23-25)

The genotype of green stemmed tomato plants is denoted as GG and of purple stemmed tomato plants as gg. When these two plants are crossed,

98. What will be the percentage of purple stemmed plants in the F1 progeny?

   Ⓐ 0%   Ⓑ 25%   Ⓒ 50%   Ⓓ 75%

99. What will be the percentage of green stemmed plants if the F1 plants are self pollinated?

   Ⓐ 0 %   Ⓑ 25 %   Ⓒ 50 %   Ⓓ 75 %

100. In what ratio would you find the genotypes GG and Gg, respectively, in the F2 progeny?

   Ⓐ 1:2   Ⓑ 2:1   Ⓒ 1:3   Ⓓ 3:1