Monthly Progressive Test

Class: XI

Subject: PCMB

Test Booklet No.: MPT04

**Test Date:** | 2 | 4 | 0 | 7 | 2 | 0 | 2 | 4 |

Time: 180 mins

Full Marks: 200

Important Instructions :

1. The Test is of 180 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 MPT0424072024.

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 scribble 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.
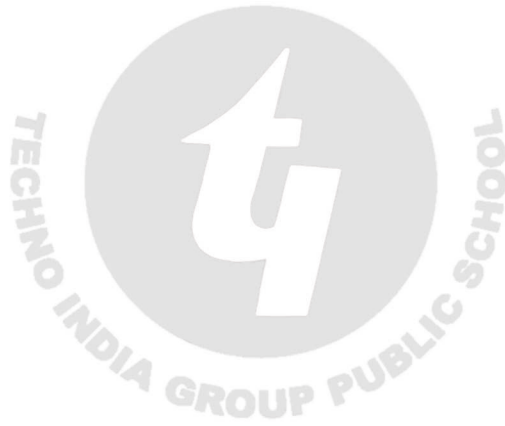
Physics

1. For a projectile with initial velocity $\vec{u} = (4\hat{i} + 3\hat{j})$ m/s. The range is (g = 10m/s^2)

   Ⓐ 2.4 m   Ⓑ 4.8 m   Ⓒ 6 m   Ⓓ 2 m

2. A ball is thrown from a field with a speed of 12m/s at an angle of 45° with the horizontal. At what distance with it hit the field again. (g = 10 m/s^2)

   Ⓐ 10.4 m   Ⓑ 12 m   Ⓒ 14.4 m   Ⓓ none of the above

3. The range of a projectile fired at an angle of 15° is 50m. If it is fired with the same speed at an angle of 45°, its range will be

   Ⓐ 100 m   Ⓑ 50 m   Ⓒ 37 m   Ⓓ 25 m

4. Two projectiles A and B are projected with angle of projection 15° for projectile A and 45° for the projectile B. Then range R_A and R_B

   Ⓐ $R_A < R_B$ Ⓑ $R_A = R_B$ Ⓒ $R_A > R_B$ Ⓓ Insufficient data

5. A projectile is given initial velocity of $(\bar{i} + 2\bar{j})$ m/s, g = 10m/s^2. The equation of its trajectory

   Ⓐ $y = 2x - 5x^2$ Ⓑ $4y = 2y - 5x^2$ Ⓒ $4y = 2x - 5x^2$ Ⓓ $y = x - 5x^2$

6. A body is projected with a velocity of 40m/s at an angle of 60° with the horozontal. Then the velocity at the maximum height.

   Ⓐ 10 m/s   Ⓑ 12 m/s   Ⓒ 20 m/s   Ⓓ 5 m/s

7. A man can throw a stone to a maximum distance of 125m. Then time of flight is

   Ⓐ 10s   Ⓑ 8s   Ⓒ 4s   Ⓓ 5s

8. A vehicle covers the first half of the distance between two places at a speed of 40 km h^{-1} and the other half at 60 km h^{-1}. The average speed of the car is

   Ⓐ 40 km h^{-1} Ⓑ 60 km h^{-1} Ⓒ 50 km h^{-1} Ⓓ 48 km h^{-1}

9. A person walks along a straight road for the first half time with velocity v_1 and the second half time with velocity v_2. Then, the mean velocity V is given by

   Ⓐ $\dfrac{2}{V} = \dfrac{1}{v_1} + \dfrac{1}{v_2}$ Ⓑ $V = \dfrac{v_1 + v_2}{2}$ Ⓒ $V = \sqrt{v_1 v_2}$ Ⓓ $\vec{v_1} + \vec{v_2}$

10. To make the longest Jump, an athelete is advised to make an angle of

    Ⓐ 0° with ground   Ⓑ 45° with ground
    Ⓒ 60° with ground   Ⓓ 89.9° with ground

11. If the angle of projection of a projectile is 30°, then how many times the horizontal range is larger than the maximum height?

Ⓐ 2   Ⓑ 3   Ⓒ $3\sqrt{4}$ Ⓓ $4\sqrt{3}$

12. A plane is traveling eastward at a speed of $500\,km\,h^{-1}$. But a $90\,km\,h^{-1}$ wind is blowing southward. What is the speed of the plane relative to the ground ?

Ⓐ $508\,km\,h^{-1}$ Ⓑ $200\,km\,h^{-1}$ Ⓒ $400\,km\,h^{-1}$ Ⓓ $150\,km\,h^{-1}$

Assertion and Reason

Directions: Read the following questions and choose any one of the following four responses.

These consist of two statements. Assertion(A) and Reason (R). Answer these questions selecting the appropriate option given below.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R true and R is not the correct explanation of A

C. A is true but R is false.

D. A is false but R is true.

13. Assertion: Elevation angle (€) of the projectile at its highest point as seen from the point of projection is tan€ = (1/2).
Reason: The projectile is fired at an angle of of 45° with the horizontal.

Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

14. Assertion: It is given that a particle has speed $7\sqrt{2}$ unit after 10s from start.
Reason: The particle has initial velocity $(3i + 4j)$ unit and acceleration $(0.1i + 0.3j)$ unit after 10 s from start.

Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

Case based (Q 15)
A particle of mass m is projected with velocity V making an angle 45° with the horizontal. When the particle lands on the level ground,

15. The magnitude of the change in vertical component of velocity is

Ⓐ $\sqrt{3}V$ Ⓑ $V/2$ Ⓒ $\sqrt{2}V$ Ⓓ $2V$

16. Starting from rest, for rectilinear motion with uniform acceleration, the $S_{5th} : S_{4th} =$

Ⓐ 9/7   Ⓑ 8/7   Ⓒ 11/6   Ⓓ 11/7

17. Two stones are dropped down simultaneously from different heights. At the time of starting, the distance between the stones is 30 cm. After 2 second, what will be the distance between the two stones?

Ⓐ 10 cm   Ⓑ 5 cm   Ⓒ 20 cm   Ⓓ 30 cm

18. A body is thrown vertically upwards with a speed of $100\,m\,s^{-1}$. On the return journey,

the speed in $m\,s^{-1}$ at the starting point will be

(A) $100\,m\,s^{-1}$ (B) $9.8\,m\,s^{-1}$ (C) $100 \times 9.8\,m\,s^{-1}$ (D) $\dfrac{100}{9.8}\,ms^{-1}$

19. The distance covered by a body is given by

$$S = at + bt^2$$

The acceleration of the body is

(A) $\dfrac{a}{b}$ (B) $2b$ (C) $a + b$ (D) $3b$

20. If velocity of rain with respect to wind by $3(-\hat{j})$ m/s and velocity of wind with respect to ground be $4\hat{i}$ m/s, then velocity of rain with respect to ground is

(A) $(4\hat{i} - 3\hat{j})$ m/s (B) $(4\hat{i} + 3\hat{j})$ m/s (C) $(-4\hat{i} + 3\hat{j})$ m/s (D) $(-4\hat{i} - 3\hat{j})$ m/s

21. A constant force 20N is acted on a mass 2kg which is at rest on a smooth floor. The magnitude of acceleration produced is

(A) $10m/s^2$ (B) $2\,m/s^2$ (C) $4\,m/s^2$ (D) $6\,m/s^2$

22. If F = $(i + \hat{j})N$ the magnitude of force is

(A) 2N (B) $\sqrt{2}N$ (C) 1N (D) 3N

23. If $(3\hat{i} + 4\hat{j})$ force acts on a mass of 1 kg, then magnitude of acceleration is

(A) $2m/s^2$ (B) $1\,m/s^2$ (C) $5\,m/s^2$ (D) $4\,m/s^2$

24. If change in velocity is 3 m/s, then change in linear momentum of mass 1 kg is

(A) 3 kg m/s (B) 2 kg m/s (C) 1 kg m/s (D) 4 kg m/s

25. The Resultant force of $(2\hat{i} + 3\hat{j})N$ and $(i + j + k)N$ is

(A) $i + 2k + 3k$ (B) $(3\hat{i} + 4\hat{j} + \hat{k})N$ (C) $(2i + 3\hat{j} + 4\hat{k})$ (D) None of these

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Chemistry

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26. Angular momentum of an electron in an orbital is given by :

(A) $n\dfrac{h}{2\pi}$ (B) $\dfrac{h}{2\pi} \times \sqrt{l(l+1)}$ (C) $n\dfrac{h}{4\pi}$ (D) None of these

27. Which one of the following is the set of correct quantum numbers of an electron in 3d orbital?

(A) $n = 3, l = 0, m = 0, s = -\dfrac{1}{2}$ (B) $n = 2, l = 3, m = 0, s = +\dfrac{1}{2}$

(C) $n = 3, l = 1, m = 0, s = -\dfrac{1}{2}$ (D) $n = 3, l = 2, m = 1, s = +\dfrac{1}{2}$

[4]

28. The total spin resulting from a d^7 configuration is:

  Ⓐ $\pm \dfrac{1}{2}$ Ⓑ ± 2 Ⓒ ± 1 Ⓓ $\pm \dfrac{3}{2}$

29. The electronegativity order of O, F, Cl and Br is:

  Ⓐ $F > O > Cl > Br$ Ⓑ $F > Cl < Br > O$ Ⓒ $Br > Cl > F > O$ Ⓓ $F < Cl < Br < O$

30. Pauling's equation for determining the electronegativity of an element, is
   X_A, X_B = electronegativity values of elements A and B
   Δ = represents polarity of $A - B$ bond

  Ⓐ $X_A - X_B = 0.208\sqrt{\Delta}$ Ⓑ $X_A + X_B = 0.208\sqrt{\Delta}$

  Ⓒ $X_A - X_B = 0.208\Delta^2$ Ⓓ $X_A - X_B = \sqrt{\Delta}$

Assertion - Reason Questions (31-32)

  OPTION A : Assertion and reason both are correct and reason is the correct explanation of assertion

  OPTION B : Assertion and reason both are correct and reason is not the correct explanation of assertion

  OPTION C : Assertion is correct but reason is wrong

  OPTION D : Assertion is wrong but reason is correct

31. **Assertion :** Ionic character of NaF is higher than NaCl
   Reason : Melting point of NaF is higher than NaCl

32. **Assertion :** NaI shows more water solubility than NaCl at a constant temperature
   Reason : Higher the radius of the anion, extent of hydration is higher

Directions (33-35): Statement based Questions: Select correct options

Option A : Both statement I and II are correct

Option B : Statement I is correct but statement II is wrong

Option C : Statement I is wrong but statement II is correct

Option D : Both statements I and II are wrong

33. **Statement I :** In case of photoelectric effect, kinetic energy of the released electrons increase with increase of frequency of the used radiation
   Statement II : In case of photoelectric effect, higher the energy of the photon striking the metal surface, higher is transfer of energy to the electrons

34. **Statement I :** Velocity of an electron in 4th Bohr orbit is lower than that for an electron in 2nd Bohr orbit

Statement II : Velocity of an electron in 1st Bohr orbit of H-atom (Z = 1) is lower than that for an electron in 1st Bohr orbit of Li^{2+} ion (Z = 3)

35. **Statement I :** Among 4f and 5d orbitals, 4f fills earlier than 5d

    Statement II : Total number of electrons in 3d orbital of $_{25}Mn^{3+}$ ion is 3

In 1913, Niels Bohr proposed an atomic model which was based upon quantum physics. Bohr's theory was applicable for one electron system only and electron revolves around the nucleus in some circular paths having fixed radius and energy. These circular paths are termed as orbits and the angular momentum is $m_e vr = n.\dfrac{h}{2\pi}$. Energy of an orbit is $-13.6\dfrac{Z^2}{n^2}$ eV and radius of an orbit is $\dfrac{0.529.n^2}{Z}\overset{\circ}{A}$.

36. Energy of which is equal to –54.4 eV?

    Ⓐ 2nd Bohr orbit of Li^{2+} (Z = 3)   Ⓑ 2nd Bohr orbit of Be^{3+} (Z = 4)

    Ⓒ 3rd Bohr orbit of Li^{2+} (Z = 3)   Ⓓ 4th Bohr orbit of Be^{3+} (Z = 4)

37. Correct value of radius of 4th orbit of Be^{3+} ion (Z = 4) ?

    Ⓐ 1.116Å   Ⓑ 2.016Å   Ⓒ 1.008Å   Ⓓ 2.116Å

38. The potential energy of an electron in the first Bohr orbit of hydrogen atom is zero, the total energy of the electron in second Bohr orbit is

    Ⓐ –30.6 eV   Ⓑ + 30.6 eV   Ⓒ – 23.8 eV   Ⓓ + 23.8 eV

39. The magnetic moment of M^{x+} (atomic number = 25) is $\sqrt{15}$ BM . The number of unpaired electrons and the value of 'x' respectively are

    Ⓐ 4, 3   Ⓑ 3, 4   Ⓒ 3, 2   Ⓓ 5, 2

40. A photon of frequency υ causes photoelectric emission from a surface with threshold frequency υ_0. The de Broglie wavelength (λ) of the photo-electron emitted is

    Ⓐ $\Delta n = \dfrac{h}{2m\lambda}$

    Ⓑ $\Delta n = \dfrac{h}{\lambda}$

    Ⓒ $\left[\dfrac{1}{\upsilon_o} - \dfrac{1}{\upsilon_o}\right] = \dfrac{mc^2}{n}$

    Ⓓ $\lambda = \sqrt{\dfrac{h}{2m(\upsilon - \upsilon_o)}}$

41. 2 gm of mixture of CO and CO_2 on reaction with excess I_2O_5 produces 2.54 gm of I_2. What would be the mass percentage of CO_2 in the original mixture?

    $$5CO + I_2O_5 \longrightarrow I_2\uparrow + 5CO_2 \quad [C = 12, O = 16, I = 127]$$

    Ⓐ 60   Ⓑ 30   Ⓒ 70   Ⓓ 35

42. 200 ml 1M HCl solution is added to 300 ml 0.2M HCl solution. The final concentration of the solution will be.

Ⓐ 0.45M   Ⓑ 0.65M   Ⓒ 0.78M   Ⓓ 0.52M

43. What is the number of atoms in 20 gm $CaCO_3$ (MW = 100) Avogadro number = 6.02×10^{23}?

Ⓐ 6.02×10^{21} Ⓑ 6.02×10^{22} Ⓒ 6.02×10^{23} Ⓓ 6.02×10^{20}

44. 1.7 gm NH_3 reacts with 4 gm O_2 according to the reaction $4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$

Atomic weight : N = 14, H = 1, O = 16

Correct statements are

(I) NH_3 is limiting reagent   (II) O_2 is excess reagent   (III) 3 gm NO is formed

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

45. A solution is formed by adding 0.3 gm urea (molar mass = 60) in 500 ml water and final volume is made 1250 ml. What is the final concentration of the solution?

Ⓐ 0.004 M   Ⓑ 0.008 M   Ⓒ 0.002 M   Ⓓ 0.016 M

46. Total number of de-Broglie wave present when an electron revolves in the 5th Bohr orbit

Ⓐ 5   Ⓑ 10   Ⓒ 15   Ⓓ 25

47. A photon of wave length 300 nm is absorbed by a gas and then re-emitted as two photon, one photon is red with $\lambda = 760$ nm. The wave number of second photon will be

Ⓐ 2.02×10^6 m^{-1} Ⓑ 3.02×10^6 m^{-1}

Ⓒ 1.02×10^6 m^{-1} Ⓓ 2.2×10^6 m^{-1}

48. Hα line of Balmer series is 6500 Å. The wave length of Hγ is

Ⓐ 4815Å   Ⓑ 4298Å   Ⓒ 7800Å   Ⓓ 3800Å

49. A node is a point at which probability of finding an electron is

Ⓐ > 99%   Ⓑ 0%   Ⓒ 50%   Ⓓ 10%

50. A 'd' orbital can accommodate maximum of _____ electrons.

Ⓐ 10   Ⓑ 2   Ⓒ 6   Ⓓ 14

Mathematics

51. If $\tan x = \dfrac{b}{a}$, then the value of $a \cos 2x + b \sin 2x$ is

Ⓐ a Ⓑ $a - b$ Ⓒ $a + b$ Ⓓ b

52. The value of $\sum\limits_{n=1}^{13} \left(i^n + i^{n+1}\right)$ where $i = \sqrt{-1}$ equals

 Ⓐ i Ⓑ i-1   Ⓒ i Ⓓ 0

53. The smallest positive integer for which $(1 + i)^{2n} = (1 - i)^{2n}$ is

 Ⓐ 4   Ⓑ 8   Ⓒ 2   Ⓓ 12

54. The set of admissible values of x such that $\dfrac{2x+3}{2x-9} < 0$ is

 Ⓐ $\left(-\infty, -\dfrac{3}{2}\right) \cup \left(\dfrac{9}{2}, \infty\right)$ Ⓑ $(-\infty, 0) \cup \left(\dfrac{9}{2}, \infty\right)$

 Ⓒ $\left(-\dfrac{3}{2}, 0\right)$ Ⓓ $\left(-\dfrac{3}{2}, \dfrac{9}{2}\right)$

55. If $3 \le 3t - 18 \le 18$, then which one of the following is true?

 Ⓐ $15 \le 2t + 1 \le 20$ Ⓑ $8 \le t < 12$

 Ⓒ $8 \le t + 1 \le 13$ Ⓓ $21 \le 3t \le 24$

56. The number of different arrangements (permutations) of the letters of the word 'Banana' is

 Ⓐ 40   Ⓑ 120   Ⓒ 60   Ⓓ 50

57. A servant has to post 5 letters and there are 4 letter boxes. In how many ways can he post the letters

 Ⓐ $^5P_4$ Ⓑ $\dfrac{5!}{4!}$ Ⓒ 5^4 Ⓓ 4^5

58. If $\cos\theta = \dfrac{1}{2}\left(a + \dfrac{1}{a}\right)$ then $\cos 3\theta$ in terms of 'a' is

 Ⓐ $\dfrac{1}{4}\left(a^3 + \dfrac{1}{a^3}\right)$ Ⓑ $\dfrac{1}{2}\left(a^3 + \dfrac{1}{a^3}\right)$ Ⓒ $4\left(a^3 + \dfrac{1}{a^3}\right)$ Ⓓ $\left(a^3 + \dfrac{1}{a^3}\right)$

59. If $(2 + i)(2 + 2i)(2 + 3i) \dots (2 + 9i) = x + iy$, then $5.8.13 \dots 85 =$

 Ⓐ $x^2 + y^2$ Ⓑ $x^2 - y^2$ Ⓒ $(x^2 + y^2)^2$ Ⓓ $(x^2 - y^2)^2$

60. In how many ways can 5 boys and 5 girls stand in a row so that boys and girls are alternate?

 Ⓐ $2(5!)^2$ Ⓑ $5! \times 4!$ Ⓒ $5! \times 6!$ Ⓓ $6 \times 5!$

Assertion Reason based Questions (61 – 62):

Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

61. Assertion (A) : $\left(\dfrac{\cos A + \cos B}{\sin A - \sin B}\right)^n + \left(\dfrac{\sin A + \sin B}{\cos A - \cos B}\right)^n = 0$ if n is odd.

   Reason (R) : $\dfrac{\cos A + \cos B}{\sin A - \sin B} = \cot\left(\dfrac{A - B}{2}\right)$

   Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

62. Assertion (A) : The solution set of the equation $\dfrac{x-1}{x-2} > 2$ is $(2, 3)$

   Reason (R) : $\dfrac{a}{b} < 0$ if $(a < 0, b > 0) \cup (a > 0, b < 0)$

   Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

Case study based Questions (63 – 65):

There are 10 girls and 8 boys in a class room including Mr Ravi, Ms Rani and Ms Radha. A list of speakers consisting of 8 girls and 6 boys has to be prepared. Mr Ravi refuses to speak if Ms Rani is a speaker. Ms Rani refuses to speak if Ms Radha is a speaker.

63. Calculate the number of ways when Ms Radha is a speaker

   Ⓐ 56   Ⓑ 28   Ⓒ 224   Ⓓ 308

64. Calculate the number of ways when Radha is not a speaker but Rani is a speaker

   Ⓐ 56   Ⓑ 28   Ⓒ 224   Ⓓ 308

65. Calculate the number of ways when both Radha and Rani are not the speakers

   Ⓐ 56   Ⓑ 28   Ⓒ 224   Ⓓ 38

66. $\dfrac{1}{1 + x^{a-b}} + \dfrac{1}{1 + x^{b-a}}$ is equal to

   Ⓐ $x^{2(a-b)}$ Ⓑ 1   Ⓒ x^{a-b} Ⓓ x^{b-a}

67. Graph drawn from the equation $y = x^2 - 3x - 4$ will be

Ⓐ Circle   Ⓑ Parabola

Ⓒ Straight Line   Ⓓ Hyperbola

68. The range of $f(x) = \dfrac{x}{1 + x^2}$ is

Ⓐ $\left[-\dfrac{1}{2}, \dfrac{1}{2}\right]$ Ⓑ $\left(-\dfrac{1}{2}, \dfrac{1}{2}\right)$ Ⓒ $\left[-\dfrac{1}{2}, 0\right) \cup \left(0, \dfrac{1}{2}\right]$ Ⓓ $[-1, 1]$

69. If P is the set of all parallelograms and T is the set of all trapeziums, then $P \cap T$ is

Ⓐ P Ⓑ T Ⓒ ϕ Ⓓ None of these

70. If $y = (1 + \tan A)(1 - \tan B)$ where $A - B = \dfrac{\pi}{4}$, then $(y + 1)^{y+1}$ is equal to

Ⓐ 9   Ⓑ 4   Ⓒ 27   Ⓓ 81

Case study based Questions (71 – 73):

A company is organizing a conference and needs to select speakers and arrange them in a specific order. There are 10 potential speakers. The conference has 4 speaking slots available.

On the basis of the above information answer the following questions:

71. How many ways can the company select 4 speakers out of the 10?

Ⓐ 210   Ⓑ 5040   Ⓒ 10000   Ⓓ 2^{20}

72. If the order in which the speakers present matters, how many different arrangement of 4 speakers can the company make?

Ⓐ 210   Ⓑ 5040   Ⓒ 1000   Ⓓ 4^{10}

73. If X, Y and Z are respectively the 1st, 2nd and 3rd speakers then in how many ways we can select 4th speaker?

Ⓐ 10 ways   Ⓑ 7! ways   Ⓒ 7 ways   Ⓓ 10! ways

Assertion Reason based Questions (74 – 75):

Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

74. **Assertion (A) :** The modulus of $Z = x + iy$ is always non-negative.

    Reason (R) : $|Z| = \sqrt{x^2 + y^2}$

    Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

75. **Assertion (A) :** If $z = 3 + 4i$, then $z\bar{z} = 25$

    Reason (R) : $z\bar{z} = |z|^2$

    Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

Biology

76. Insectivorous plants such as pitcher plant and venus fly trap, have

    Ⓐ Modified leaf   Ⓑ Modified stem   Ⓒ Modified root   Ⓓ All of the above

77. Choose the correct statement for mango

    Ⓐ Epicarp is thin   Ⓑ Mesocarp is fleshy and edible

    Ⓒ Endocarp is strong and hard   Ⓓ All of these

78. Fabaceae

    Ⓐ Was earlier called Papilionoideae

    Ⓑ Was a sub family of Leguminosae

    Ⓒ Is distri buted all over the world

    Ⓓ All of the above

79. Primary meristem is

    Ⓐ Apical meristem

    Ⓑ Intercalary meristem

    Ⓒ Root apical meristem and shoot apical meristem

    Ⓓ Both (1) and (2)

80. Cambium is present in between

    Ⓐ Phloem and xylem   Ⓑ Permanent mature cells

    Ⓒ Collenchyma and sclerenchyma   Ⓓ Collenchyma and parenchyma

81. Compared to those of humans, the erythrocytes in frog are

    Ⓐ Without nucleus but with haemoglobin   Ⓑ Nucleated and with haemoglobin

    Ⓒ Very much smaller and fewer   Ⓓ Nucleated and without haemoglobin

82. In frog, the surface of attachment of tongue is

 Ⓐ Pterygoid   Ⓑ Hyoid apparatus   Ⓒ Parasphenoid   Ⓓ Palatine

Question No. 8 to 10 consist of two statements- Assertion (A) and Reason (R) . Answer these questions selecting the appropriate option from the list given below.

 A. Both A and R are true and R is the correct explanation of A.

 B. Both A and R are true and R is not the correct explanation of A.

 C. A is true but R is false.

 D. A is false but R is true.

83. **Assertion:** Prop roots of banyan are adventitious roots.

 Reason: These develop from the nodes and internodes of the stem.
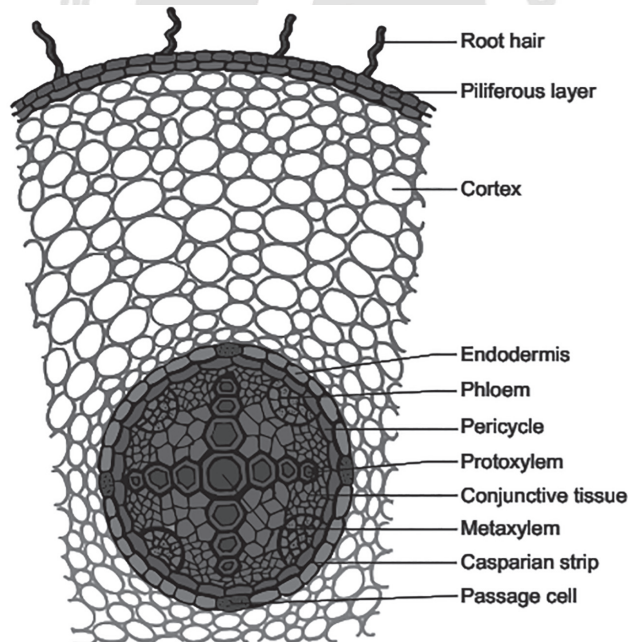
84. **Assertion:** Quiescent centre is found in the centre of the root apex.

 Reason: It consists of actively dividing cells.

85. **Assertion:** The alimentary canal of the frog is short.

 Reason: Frogs are carnivores.

Study the given diagram and answer the following questions (Questions 11 to 15)

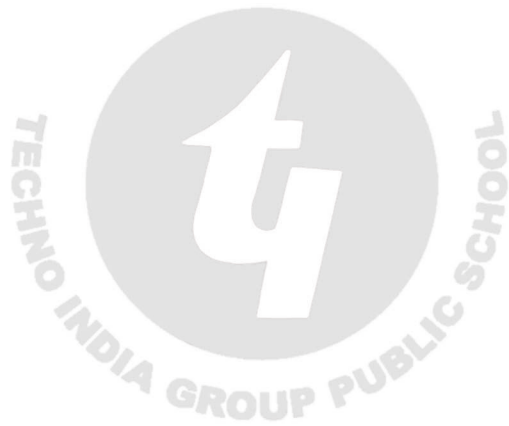**86.** The diagram given above shows TS of –

 Ⓐ Monocot root   Ⓑ Dicot root   Ⓒ Monocot stem   Ⓓ Dicot stem

87. Cortex is the region found between the –

 Ⓐ Epidermis and stele   Ⓑ Pericycle and endodermis

 Ⓒ Endodermis and pith   Ⓓ Endodermis and vascular bundle

88. Water impermeable, waxy material secreted by endodermal cells in the form of Casparian strip is
Ⓐ Lignin
Ⓑ Suberin
Ⓒ Conjunctive tissue
Ⓓ Pectin

89. The next layer to endodermis is a layer of thick walled parenchymatous cells , called
Ⓐ Casparian strips
Ⓑ Radial bundles
Ⓒ Pericycle
Ⓓ Pith

90. Stele consists of—
Ⓐ Pericycle and pith
Ⓑ Pericycle and vascular strand
Ⓒ Pericycle, vascular strand and pith
Ⓓ Vascular strand and pith

91. Water vascular system is observed in -
Ⓐ Coelenterates
Ⓑ Nematodes
Ⓒ Echinoderms
Ⓓ Molluscs

92. Which of the following are called vascular cryptogams?
Ⓐ Pteridophytes
Ⓑ Bryophytes
Ⓒ Gymnosperms
Ⓓ Algae

93. Red tides in the sea are caused by
Ⓐ Dinoflagellates
Ⓑ Euglenoids
Ⓒ Slime moulds
Ⓓ Protozoans

94. Mushrooms belong to—
Ⓐ Phycomycetes
Ⓑ Ascomycetes
Ⓒ Basidiomycetes
Ⓓ Deuteromycetes

95. The class consisting of the first jawless fishes, all of which are extinct now is—
Ⓐ Ostracodermi
Ⓑ Cyclostomata
Ⓒ Chondrichthyes
Ⓓ Osteichthyes

96. The mature seeds of plants, like peas and gram, have no endosperm because
Ⓐ These plants are not angiosperms
Ⓑ There is no double fertilisation in them
Ⓒ Endosperm is not formed in them
Ⓓ Endosperm gets used up by the developing embryo during seed development

97. Which of the following plants is used to extract blue dye?
Ⓐ *Trifolium*
Ⓑ *Indigofera*
Ⓒ *Lupin*
Ⓓ *Cassia*

98. A conjoint and open vascular bundle will be observed in the transverse section of ------
Ⓐ Monocot root
Ⓑ Monocot stem
Ⓒ Dicot root
Ⓓ Dicot stem

99. Water containing cavities in vascular bundles are found in—
Ⓐ Sunflower
Ⓑ Maize
Ⓒ Cycas
Ⓓ Pinus

100. Bidder's canal is found in—
Ⓐ Kidney
Ⓑ Testes
Ⓒ Urinary bladder
Ⓓ Cloaca