Monthly Progressive Test

Class: XI

Subject: PCMB

Test Booklet No.: MPT-02

Test Date: | 0 | 7 | 0 | 8 | 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   MPT02 07082025.

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. Friction force for a rest body placed on a horizontal surface depends on

Ⓐ Nature of contact surface   Ⓑ Normal reaction force

Ⓒ Applied force   Ⓓ Area of contact

2. Sand is dropped on a conveyor belt at the rate of 5 kg/s. The extra force required to keep the belt moving at $2\,\text{ms}^{-1}$ is

Ⓐ 1 N   Ⓑ 10 N   Ⓒ 20 N   Ⓓ 4 N

3. Force on a particle is given the graph with time shown in figure. Find the change in momentum.

Ⓐ $\dfrac{\pi}{2}F_0^2$ Ⓑ $\dfrac{\pi}{8}T_0^2$

Ⓒ $\dfrac{\pi}{4}F_0T_0$ Ⓓ all of the above
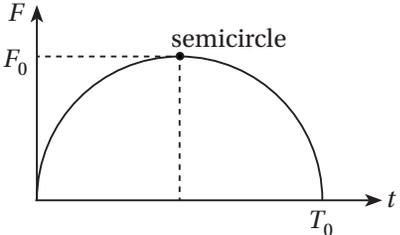
4. According to the diagram thy system moving upward with constant velocity $2\,\text{ms}^{-1}$. Find the net force acting on the 2 kg mass.

Ⓐ 30 N   Ⓑ 50 N

Ⓒ 60 N   Ⓓ zero
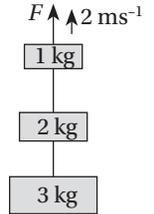
5. A constant force (F) is applied on a stationary particle of mass M. The velocity attained by particle in certain displacement will be proportional to

Ⓐ m Ⓑ $\dfrac{1}{m}$ Ⓒ $\sqrt{m}$ Ⓓ $\dfrac{1}{\sqrt{m}}$

6. Kinetic Energy of a body increases by 2% then momentum of the body increases by

Ⓐ 1.21%   Ⓑ 0.88%   Ⓒ 1%   Ⓓ 4%

7. Potential Energy of a body of mass m is $ax + by$ the acceleration of the particle is

Ⓐ $\dfrac{\sqrt{a^2+b^2}}{m}$ Ⓑ $\dfrac{a+b}{m}$ Ⓒ $\dfrac{(a+b)^2}{m}$ Ⓓ $\dfrac{\sqrt{a+b}}{m}$

8. Which one of the following motion is an example of one dimensional motion

Ⓐ velocity of a particle $=3\hat{i}$ and acceleration $=4\hat{j}$ Ⓑ $\vec{v}\cdot\vec{a}=0$

Ⓒ $\vec{v}\cdot\vec{a}<0$ Ⓓ velocity $=3\hat{i}+4\hat{j}$ and acceleration $=0.3\hat{i}+0.4\hat{j}$

9. A particle throws vertically upward with some initial velocity and after some time interval it returns to the point of projection, for the whole motion acceleration-time graph is
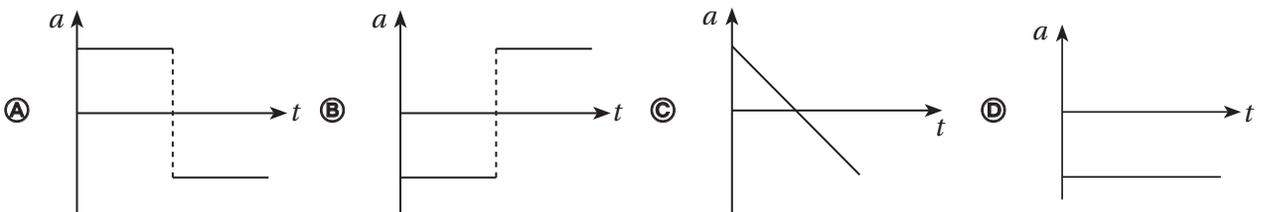
10. A particle starts moving with constant acceleration, then its velocity-displacement graph is

Ⓐ

Ⓑ

Ⓒ

Ⓓ
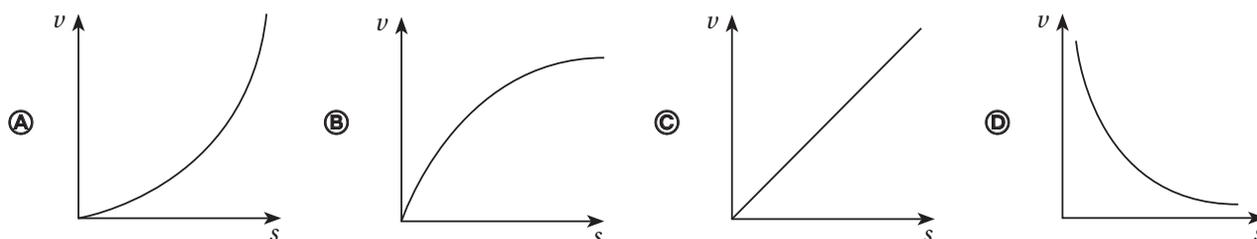
■ **Assertion-Reason type Questions**

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

Ⓐ If both Assertion and Reason are true and Reason is the correct explanation of the Assertion.

Ⓑ If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.

Ⓒ Assertion is true but the Reason is false.

Ⓓ Assertion is False and Reason is true.

11. **Assertion:** In case of uniform circular motion $\vec{v} \cdot \vec{a} = 0$.

Reason: No unbalanced force act on uniform circular motion.

12. **Assertion:** Work done by friction force in a circular path is not equal to zero.

**Reason:** Friction force is a example of non conservative force.

13. **Assertion:** It is difficult to move a cycle along a road with its brakes on.

Reason: Sliding friction coefficient is greater than the rolling friction.

14. **Assertion:** If net force acting on a system is zero, then work done on the system may be non zero.

Reason: Internal forces acting on a system can increase its kinetic energy.

■ **Case Based Questions**

10 kg →$F = 100 - 10t$

$\mu_s = 0.6$
$\mu_k = 0.4$
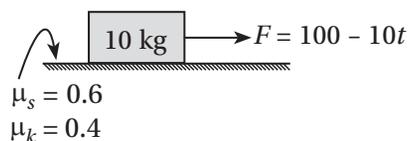
According to the diagram friction force act on the 10 kg mass

15. At time $t = 7$ s

Ⓐ 60 N   Ⓑ 40 N   Ⓒ 30 N   Ⓓ 80 N

16. At time $t = 5$ s

Ⓐ 60 N   Ⓑ 40 N   Ⓒ 30 N   Ⓓ 80 N

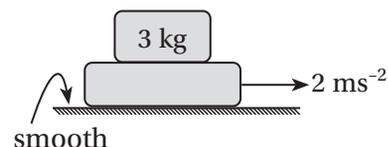**17.** At time $t = 4$ s

Ⓐ 60 N   Ⓑ 40 N   Ⓒ 30 N   Ⓓ 80 N

According to the diagram the upper block is at rest with the lower block, coefficient of friction between the blocks is 0.4.

3 kg
→2 ms^{-2}
smooth

18. Friction force act on 3 kg mass is

Ⓐ 12 N   Ⓑ 6 N   Ⓒ 9 N   Ⓓ zero
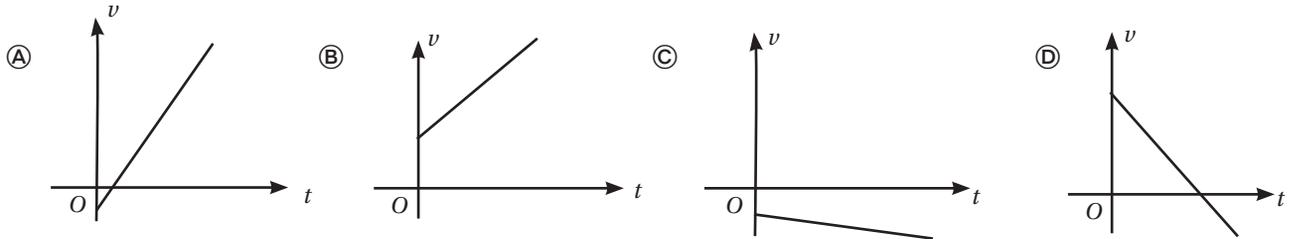
19. Work done by the friction force with respect to the ground in two seconds is

    Ⓐ 48 J   Ⓑ 24 J   Ⓒ 12 J   Ⓓ zero
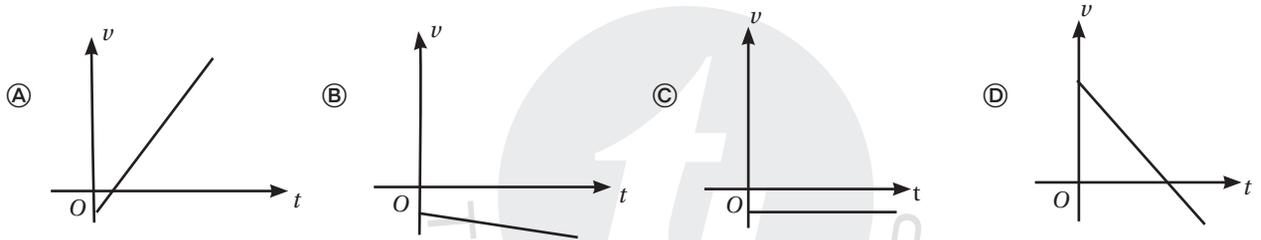
20. Work done by the friction force with respect to the lower block in two seconds is

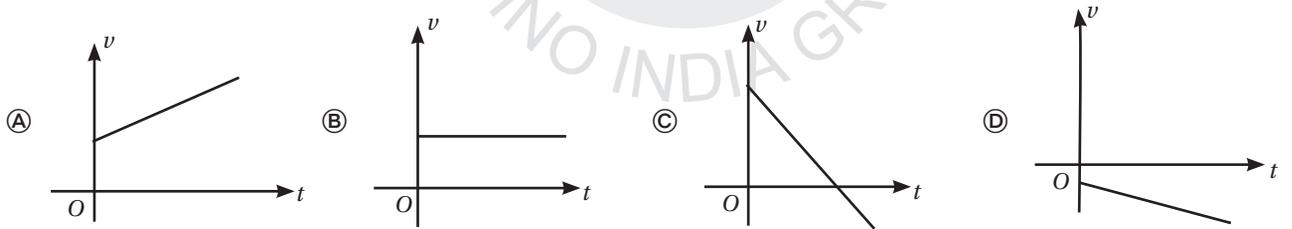   Ⓐ 48 J   Ⓑ 24 J   Ⓒ 12 J   Ⓓ zero

21. A particle is going along a straight line with constant acceleration a, having initial velocity u. Then for $u > 0$ and $a > 0$.


22. A particle is going along a straight line with constant acceleration a, having initial velocity u. then for $u \longrightarrow$ –ve and $a \longrightarrow$ positive

23. A particle is going along a straight line with constant acceleration a, having initial velocity u. Then for $u \longrightarrow$ positive and $a < 0$, select the correct graph

24. A particle is going along a straight line with constant acceleration a, having initial velocity u. Then for $u < 0$ and $a < 0$, select the correct graph
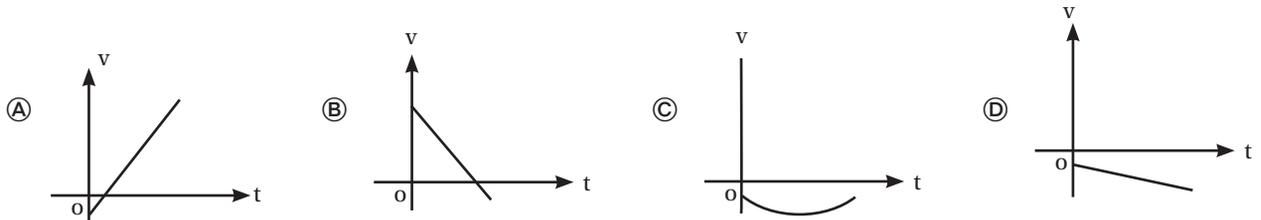
25. A particle has zero speed but non zero acceleration.

    Ⓐ body which is about to fall   Ⓑ Extreme position of oscillating body

    Ⓒ both (a) and (b)   Ⓓ not possible.

Chemistry

26. The de-Broglie relationship in between λ of a moving particle with kinetic energy is

Ⓐ $\lambda = \dfrac{h}{2m(k.E)}$ Ⓑ $\lambda = \dfrac{\sqrt{2m(K.E)}}{h}$ Ⓒ $\lambda = \dfrac{h}{\sqrt{2m(K.E)}}$ Ⓓ $\lambda = \dfrac{h}{2m\sqrt{K.E}}$

27. In hydrogen atom energy of electron in 2nd. Bohr's orbit is –3.4 ev. The kinetic energy of electron in this orbit is :

Ⓐ – 3.4 ev   Ⓑ + 3.4 ev   Ⓒ – 6.8 ev   Ⓓ + 1.7 ev

28. How many electrons can fit in the orbital for which n = 3, l = 1, m_l = 0 ?

Ⓐ 2   Ⓑ 6   Ⓒ 10   Ⓓ 14

29. Maximum number of electrons in a subshell of an atom is determined by the following :

Ⓐ $2l + 1$ Ⓑ $4l - 2$ Ⓒ $2n^2$ Ⓓ $4l + 2$

30. Maximum number of electrons in a subshell with l = 3, n = 4 is :

Ⓐ 10   Ⓑ 12   Ⓒ 14   Ⓓ 16

31. The graph may belong with :

Ⓐ 1s   Ⓑ 2p   Ⓒ 3d   Ⓓ All of these

32. The schrödinger wave equation for hydrogen atom for 2s orbital ;

$4.2s = \dfrac{1}{\sqrt{8}} \left(\dfrac{z}{a_0}\right)^{\frac{s}{2}} \left(2 - \dfrac{zr}{a_0}\right) e^{\frac{-zr}{2a_0}}$, then hydrogen radial mode will be at a distance of :

Ⓐ a_0 Ⓑ $2a_0$ Ⓒ $\dfrac{a_0}{2}$ Ⓓ $\dfrac{a_0}{3}$

33. The number of radial nodes in 3s and 2p respectively are :

Ⓐ 2 and 0   Ⓑ 0 and 2   Ⓒ 1 & 2   Ⓓ 2 & 1

34. In the Ruherford's scattering experiment, the number of α-particles scattered at an angle $\theta = 60°$, is 12 per min. the number of α-particles per minute when scattered at an angle of 90° is :

Ⓐ 160   Ⓑ 10   Ⓒ 6   Ⓓ 3

35. The orbital angular momentum of electron in 'd' orbital is equal to :

Ⓐ $0\,\hbar$ Ⓑ $\sqrt{6}\,\hbar$ Ⓒ $\sqrt{2}\,\hbar$ Ⓓ $2\sqrt{3}\,\hbar$

36. What is he maximum number of orbitals that can be idenified wih the following quantum numbers ?

n =3, l = 1, ml = 0

Ⓐ 1   Ⓑ 2   Ⓒ 3   Ⓓ 4

37. The correct set of four quantum numbers for the valence elecron of rubidium atom (Z = 37) is :

    Ⓐ $5,0,0,+\frac{1}{2}$ Ⓑ $5,1,0,+\frac{1}{2}$ Ⓒ $5,1,1,+\frac{1}{2}$ Ⓓ $6,0,0,+\frac{1}{2}$

38. If uncertainty in position and momentum are equal then uncertainlyh in velocity is :

    Ⓐ $\sqrt{\frac{h}{\pi}}$ Ⓑ $\frac{1}{2m}\sqrt{\frac{h}{\pi}}$ Ⓒ $\sqrt{\frac{h}{2\pi}}$ Ⓓ $\frac{1}{m}\sqrt{\frac{h}{\pi}}$

39. An ion M^{a+} has the magnetic moment equal to $\sqrt{24}$ BM. The value of 'a' is (At No. of M = 24)

    Ⓐ 2   Ⓑ 5   Ⓒ 3   Ⓓ 4

40. A piece of Mg is dissolved in 40 ml of $\frac{N}{10}$ HCl completely. The excess of acid was neutralized by 15 ml of $\frac{N}{5}$ NaOH. The weight of Mg is :

    Ⓐ 0.24 g   Ⓑ 0.024 g   Ⓒ 0.012 g   Ⓓ 0.40 g

Assertion and Reason Based Questions (Q. 41-44):

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

   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.

41. **Assertion (A):** Angular momentum of an electron in an atom is quantized.

    Reason (R): In an atom only those orbits are permitted in which angular momentum of the electron is a natural number multiple of $\frac{h}{2\pi}$

    Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

42. **Assertion (A):** The radius of second orbit of He^+ is equal to that of first orbit of hydrogen.

    Reason (R): The radius of an orbit in hydrogen like species is directly propotional to n and inversely propotional to z.

    Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

43. **Assertion (A):** Energy of electron is taken negative.

    Reason (R): Energy of electron at infinity is zero.

    Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

44. **Assertion (A):** Bohr's orbit are also called stationary states :

    Reason (R): Electrons are stationary in an orbit.

    Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

Case Based Question (Q45 to Q.47) :

Arrangement of the electron in various orbital is done by :

(i) Aufbau's principle, (ii) Pauli's exclusion principle, (iii) Hund's rule of maximum multiplicity.

45. Which of the following has the highest energy $(z > 1)$?

Ⓐ 4s   Ⓑ 4p   Ⓒ 4d   Ⓓ 4f

46. For hydrogen like ion, energy of orbital depend on :

Ⓐ n   Ⓑ n + l Ⓒ n + l + m   Ⓓ n + l + m + s

47. In the given E. C. which violaes Hunds' rule :

Ⓐ ↑ ↑ ↑ ↑ ↓   Ⓑ ↑↓ ↑ ↑   Ⓒ ↑ ↑ ↑ ↑ ↑   Ⓓ ↓ ↑ ↓

Case Based Question (Q.48 – Q.50)

Orbitals are the pictorial representation of ψ or ψ^2.

$\psi = \psi(r)$ $\psi\,(\theta, \phi)$
Radial wave function   Angular wave function

ψ^2 tell about the probability of finding electron.

48. Which of the following orbital is non-directional ?

Ⓐ S   Ⓑ 2Pn   Ⓒ 4 $dx^2 - y^2$ Ⓓ dz^2

49. A 2Px orbital is shown by given diagram : Correct regarding diagram is

Ⓐ Sign represent change only   Ⓑ Sign represent sign of wave function

Ⓒ Both 1 & 2   Ⓓ Sign represent sign of ψ^2

50. ψ_{320} represent orbital :

Ⓐ 5 S   Ⓑ 3 S   Ⓒ 3 d   Ⓓ 5 d

Mathematics

51. The product of the roots of the equation $9x^2 - 18|x| + 5 = 0$ is

Ⓐ $\dfrac{25}{9}$ Ⓑ $\dfrac{25}{81}$ Ⓒ $\dfrac{5}{9}$ Ⓓ $\dfrac{5}{27}$

52. The value of k for which the quadratic equation $kx^2 + 1 = kx + 3x - 11x^2$ has real and equal roots are

Ⓐ –11, –3   Ⓑ 5, 7   Ⓒ 5, –7   Ⓓ –7, 25

53. If the roots of the equation $12x^2 - mx + 5 = 0$ are in the ratio 2 : 3, then $m =$

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

54. If α and β are the roots of the equation $2x(2x + 1) = 1$, then β is equal to

Ⓐ $2\alpha^2$ Ⓑ $-2\alpha(\alpha + 1)$ Ⓒ $2\alpha(\alpha - 1)$ Ⓓ $2\alpha(\alpha + 1)$

55. $a + ib < c + id$ is meaningful if

Ⓐ $a^2 + b^2 = 0$ Ⓑ $b^2 + c^2 = 0$

Ⓒ $a^2 + c^2 = 0$ Ⓓ $b^2 + d^2 = 0$

56. If $x + iy = \sqrt{\dfrac{a+ib}{c+id}}$, then $\left(x^2 + y^2\right)^2 = ?$

Ⓐ $\dfrac{a^2 + b^2}{c^2 + d^2}$ Ⓑ $\dfrac{a+b}{c^2 + d^2}$ Ⓒ $\dfrac{c^2 + d^2}{a^2 + b^2}$ Ⓓ $\left(\dfrac{a^2 + b^2}{c^2 + d^2}\right)^2$

57. The amplitude of the complex number $Z = \sin\alpha + i(1 - \cos\alpha)$ where $\alpha \in (0, \pi)$ is

Ⓐ $2\sin\left(\dfrac{\alpha}{2}\right)$ Ⓑ $\dfrac{\alpha}{2}$ Ⓒ α Ⓓ None of these

58. The sequence $S = i + 2i^2 + 3i^3 + 4i^4 + \cdots$ upto 100 terms simplifies to, where $i = \sqrt{-1}$

Ⓐ $50(1 - i)$ Ⓑ $25i$ Ⓒ $25(1 + i)$ Ⓓ $100(1 - i)$

59. The domain of definition of the function

$f(x) = \log_4\left[\log_5\left\{\log_3\left(18x - x^2 - 77\right)\right\}\right]$ is

Ⓐ $(8, 10)$ Ⓑ $[8, 10]$ Ⓒ $(-\infty, 8]$ Ⓓ $[10, \infty)$

60. If $f(x)$ is an odd periodic function with period 2, then $f(4)$ equals

Ⓐ -4 Ⓑ 4 Ⓒ 2 Ⓓ 0

61. If $\sin\theta + 7\cos\theta = 5$, then $\tan\left(\dfrac{\theta}{2}\right)$ is a root of the equation

Ⓐ $x^2 - 6x + 1 = 0$ Ⓑ $6x^2 - x - 1 = 0$ Ⓒ $6x^2 + x + 1 = 0$ Ⓓ $x^2 - x + 6 = 0$

62. The greatest value of $y = 3\cos\left(\theta + \dfrac{\pi}{3}\right) + 5\cos\theta + 3$ is

Ⓐ 11 Ⓑ 3 Ⓒ 6 Ⓓ 10

63. Let $S = \{1, 2, 3, 4\}$. Then the total number of unordered pairs of disjoint subsets of S equal to,

Ⓐ 25 Ⓑ 34 Ⓒ 42 Ⓓ 41

64. Let $n(A) = 2$, $n(B) = 4$. The number of subsets of $A \times B$ having more than 2 elements is

Ⓐ 211 Ⓑ 256 Ⓒ 220 Ⓓ 219

65. Let $X = \{1, 2, 3, 4, 5\}$. The number of different ordered pairs (Y, Z) that can be formed such that $Y \subseteq X$ and $Z \subseteq X$ but $Y \cap Z = \phi$

Ⓐ 2^5 Ⓑ 3^5 Ⓒ 4^5 Ⓓ 5^5

Assertion Reasoning Based Questions [Q : 66–69]

Directions:

Each of these questions contains two statements Assertion (A) and Reason (R). Each of the questions has four alternative choices, any one of the which is the correct answer. You have to select one of the codes (a), (b), (c) and (d) given below.

(a) A is true, R is true, R is a correct explanation of A

(b) A is true, R is true, R is not correct explanation of A

(c) A is true, R is false

(d) A is false R is true

66. **Assertion (A) :** If $Z = (1,2)$ then $Z^{-1} = \left(\dfrac{1}{5}, -\dfrac{2}{5}\right)$

    Reason (R) : If $Z \in C$ then $Z^{-1} = \left(\dfrac{x}{x^2 + y^2}, \dfrac{-y}{x^2 + y^2}\right)$

    Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

67. **Assertion (A) :** Number of solution of $\||x-1|+2| = 1$ is 0

    Reason (R) : If $x^2 = k$ then $x = \pm\sqrt{k}$

    Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

68. **Assertion (A) :** If $p(q-r)x^2 + q(r-p)x + r(p-q) = 0$ has equal roots then p, q, r are in AP.

    Reason (R) : a, b, c are in AP if $2b = a + c$

    Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

69. **Assertion (A) :** Let $P(A)$ denotes power set of A. Therefore,

    $$P\big(P(P(\phi))\big) = \big\{\phi, \{\phi\}, \{\phi, \{\phi\}\}\big\}$$

    Reason (R) : The set of all subsets of A is called power set of A.

    Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

Case Study Based Questions

Case I : [Q : 70–72]

Mr. X is teaching his students how to draw a simple graph by plotting a few points. He says, the graph of any equation of the form $y = ax^2 + c$ with $a \neq 0$ is a parabola with vertex $(0,c)$, opening upward if $a > 0$ or downward if $a < 0$. If $c = 0$, the equation reduces to $y = ax^2$ and the vertex is at the origin $(0,0)$. To get x intercept put $y = 0$ and to get y intercept put $x = 0$. He also teaches symmetries of Graphs of Equations in x and y. He asks his students to sketch the graph of the equation $y = x^2 - 3$.

On the basis of this answer the following questions.

70. What is the y-intercept of the graph of $y = x^2 - 3$?

    Ⓐ $-\sqrt{3}$ Ⓑ $\sqrt{3}$ Ⓒ $2\sqrt{3}$ Ⓓ none of these

71. If $y_{min} = \alpha - 3$ at $x = \alpha^2$ then possible value of α is

    Ⓐ –1   Ⓑ 0   Ⓒ 1   Ⓓ none of these

72. The given curve $y = x^2 - 3$ is rotated by 90° in anticlockwise direction. What is the axis of symmetry of the rotated curve?

    Ⓐ x axis   Ⓑ y axis   Ⓒ z axis   Ⓓ none of these

Case II : [Q : 73–75]

The formulas for the powers of a complex number with integer exponents are preserved for the algebraic form $z = x + iy$. Setting $z = i$, we obtain, $i^0 = 1, i^1 = i, i^2 = -1, i^3 = -i, i^4 = 1, \ldots$. For any integer n we can easily calculate i^n.

73. Compute : $i^1 \cdot i^2 \cdot i^3 \cdot \ldots \cdot i^{2025}$

Ⓐ i^1 Ⓑ i^2 Ⓒ i^3 Ⓓ i^4

74. Find the quadratic equation with real coefficients that has $i^1 + i^2 + i^3 + + i^{2025}$ as its one root.

Ⓐ $x^2 - 1 = 0$ Ⓑ $x^2 + 1 = 0$ Ⓒ $x^2 - i = 0$ Ⓓ $x^2 + i = 0$

75. Solve in C the equation $z^2 = i$. Let z_1 and z_2 be the roots of $z^2 = i$, let us define $d(z_1,z_2) = |z_1 - z_2|$. Compute $d(z_1,z_2)$.

Ⓐ 1   Ⓑ $\dfrac{1}{\sqrt{2}}$ Ⓒ $\sqrt{2}$ Ⓓ none of these

Biology

76. Match the following and choose the correct option:

	Column I		Column II
(a)	Aleurone layer	(i)	Without fertilization
(b)	Parthenocarpic fruit	(ii)	Proteinous layer
(c)	Ovule	(iii)	Double fertilization
(d)	Endosperm	(iv)	Seed

Ⓐ (a) –(i); (b) – (ii); (c) – (iii); (d) – (iv)   Ⓑ (a) –(ii); (b) – (i); (c) – (iv); (d) – (iii)
Ⓒ (a) –(iv); (b) – (ii); (c) – (i); (d) – (iii)   Ⓓ (a) –(ii); (b) – (iv); (c) – (i); (d) – (iii)

77. Each anther is usually _____ and has _____ chambers, the pollen sacs.
Ⓐ Trilobed, three   Ⓑ Bilobed, two   Ⓒ Trilobed, two   Ⓓ Bilobed, three

78. When we peel the skin of a potato, we remove the _____
Ⓐ periderm   Ⓑ epidermis   Ⓒ sapwood   Ⓓ None of the above

79. In plants, cortex is a region located between _____ and _____ of roots and stems.
Ⓐ epidermis and stele   Ⓑ endodermis and pith
Ⓒ endodermis and vascular bundle   Ⓓ pericycle and endodermis

80. In frogs, hepatic portal vein drains blood to liver from
Ⓐ kidney   Ⓑ testes   Ⓒ cloaca   Ⓓ urinary bladder

81. Which organelle is responsible for packaging protein?
Ⓐ Golgi body   Ⓑ Endoplasmic reticulum
Ⓒ Nucleolus   Ⓓ All of the above

82. Who proposed the Fluid Mosaic Model of plasma membrane?
Ⓐ Benda   Ⓑ Singer and Nicolson
Ⓒ Schleiden and Schwann   Ⓓ J. David Robertson

83. DNA is not present in
Ⓐ Nucleus   Ⓑ Mitochondria   Ⓒ Chloroplast   Ⓓ Ribosomes

84. Which structure performs the functions of mitochondria in bacteria?

   Ⓐ Mesosomes   Ⓑ Nucleoid   Ⓒ Ribosomes   Ⓓ Cell wall

85. Periderm is produced by:

   Ⓐ Vascular cambium   Ⓑ Fascicular cambium

   Ⓒ Phellogen   Ⓓ Intrafascicular cambium

86. Identify the symmetry shown by the following flowers, in order.

Geranium   *Pisum*   *Canna*

   Ⓐ Actinomorphic, Zygomorphic, Asymmetric   Ⓑ Asymmetric, Actinomorphic, Zygomorphic

   Ⓒ Actinomorphic, Asymmetric , Zygomorphic   Ⓓ Zygomorphic , Actinomorphic, , Asymmetric

87. In which of the following flowers, ovary is superior?

   Ⓐ Epigynous flower   Ⓑ Perigynous flower

   Ⓒ Hypogynous flower   Ⓓ None of the above

88. Urecose glands in cockroach is concerned with:

   Ⓐ Excretion   Ⓑ Locomotion

   Ⓒ Nervous System   Ⓓ Reproduction

89. Which one of the following is not an inclusion body found in prokaryotes?

   Ⓐ Cyanophycean granule   Ⓑ Glycogen granule

   Ⓒ Polysome   Ⓓ Phosphate granule

90. Flagella of prokaryotic and eukaryotic cells differ in:

   Ⓐ type of movement and placement in cell

   Ⓑ location in cell and mode of functioning

   Ⓒ microtubular organisation and mode of functioning

   Ⓓ microtubular organisation and type of movement

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)** : Specialisation of cells is advantageous for organisms.

    Reason (R) : It increases the operational efficiency of an organism.

    Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

92. **Assertion (A)** : Alimentary canal of frogs is short.

    Reason (R) : Frogs are carnivorous.

    Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

93. **Assertion (A)** : Spongy parenchyma constitute a part of mesophyll tissue of leaves.

    Reason (R) : Spongy parenchyma has lesser number of chloroplasts than palisade parenchyma.
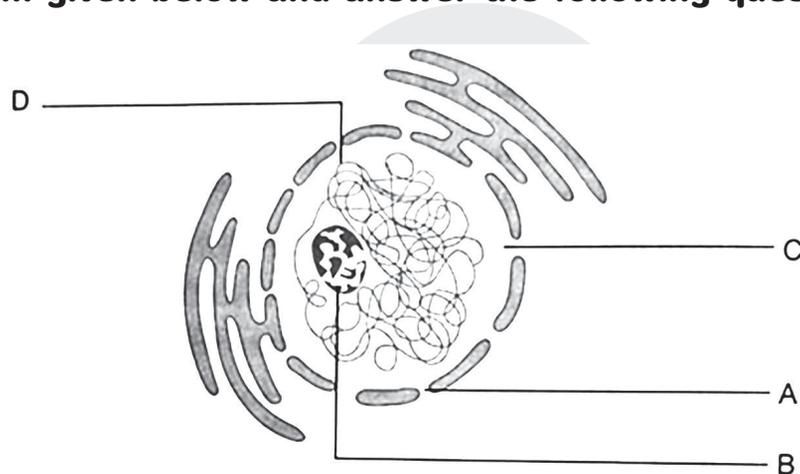
    Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

94. **Assertion (A)** : Wheat, rice and onion show fibrous root system.

    Reason (R) : Wheat, rice and onion are not angiosperms.

    Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

Study the diagram given below and answer the following questions (95-97):

95. Identify the correct pair of organelles shown in the given figure.

    Ⓐ Nucleus and ER   Ⓑ Nucleolus and RER

    Ⓒ Nucleus and Golgi body   Ⓓ Nucleoid and perixosome

96. The major function of the structure B is :

    Ⓐ Synthesis of proteins   Ⓑ Synthesis of ribosomal RNA

    Ⓒ Synthesis of centrosome   Ⓓ Takes part in cell division

97. Which of the above structures is found in both prokaryotic and eukaryotic cells?

    Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

Read the given passage and answer the following questions (98-100) :

A leaf is said to be simple in which the leaf blade or lamina is entire. In compound leaves, the lamina is dissected upto the midrib or upto the tip of the petiole to form many leaflets. Compound leaves are of two types, pinnately compound leaves and palmately compound leaves.

98. Select the correct statement:

Ⓐ Mango leaf is not a compound leaf

Ⓑ The pattern of arrangement of leaves on the stem is called phyllotaxy

Ⓒ Rose leaf is pinnately compound

Ⓓ All of the above

99. What is 'rachis'?

Ⓐ Axis of a simple leaf   Ⓑ Axis of a compound leaf

Ⓒ Midrib of the leaflets of a compound leaf   Ⓓ Axil of the leaflets of a compound leaf

100. What is represented by the picture given below?

Ⓐ Palmately compound leaves   Ⓑ Pinnately compound leaves

Ⓒ Whorled phyllotaxy   Ⓓ Alternate phyllotaxy