Monthly Progressive Test

Class: XI

Subject: PCMB

Test Booklet No.: MPT-03

Test Date: 2 2 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 MPT03 22082025.

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 rod is rotating about an axis passing through its centre and perpendicular to its length. The radius of gyration for the rod is
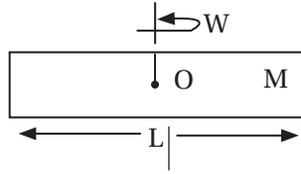

   Ⓐ $\dfrac{L}{12}$ Ⓑ $\dfrac{L}{\sqrt{12}}$ Ⓒ $\dfrac{L}{6}$ Ⓓ $\dfrac{L}{\sqrt{6}}$

2. A disc is rotating with angular velocity ω. A force F acts at a point whose position vector with respect to the axis of rotation is r. The power associated with torque due to the force is given by

   Ⓐ $(\vec{r}\times\vec{f})\cdot\vec{\omega}$ Ⓑ $(\vec{r}\times\vec{f})\times\vec{\omega}$ Ⓒ $\vec{r}\times(\vec{f}\cdot\vec{\omega})$ Ⓓ $\vec{r}\cdot(\vec{f}\times\vec{\omega})$

3. A flywheel of moment of inertia 0.4 kg/m^2 and radius 0.2 m is free to rotate about a central axis. If a string is wrapped around it and it is pulled with a force of 10 N, then its angular velocity after 4S will be

   Ⓐ 10 rad/s   Ⓑ 5 rad/s   Ⓒ 20 rad/s   Ⓓ None of these

4. Two discs having mass ratio $\left(\dfrac{1}{2}\right)$ and diameter ratio $\left(\dfrac{2}{1}\right)$ then find ratio of moment of inertia

   Ⓐ 2 : 1   Ⓑ 1 : 1   Ⓒ 1 : 2   Ⓓ 2 : 3

5. Two bodies have their moments of inertia I and 2I respectively about their axis of rotation. If their kinetic energies of rotation are equal, their angular momentum will be in the ratio

   Ⓐ 1 : 2   Ⓑ $\sqrt{2}$: 1   Ⓒ 2 : 1   Ⓓ 1 : $\sqrt{2}$

6. By keeping moment of inertia of a body constant, if we double the time period, then angular momentum of body

   Ⓐ remains constant   Ⓑ becomes half   Ⓒ doubles   Ⓓ quadruples

7. A hoop of radius 2m weighs 100 kg. If rolls along a horizontal floor, so that its centre of mass has a speed of 20 cm/s. How much work has to be done to stop it?

   Ⓐ 10 J   Ⓑ 12 J   Ⓒ 4 J   Ⓓ 3 J

8. A point mass m is attached to a massless string whose other end is fixed at P as shown in future. The mass is undergoing circular motion in xy plane with centre O and constant angular speed ω. If the angular momentum of the system, calculated about O and P be L_0 and L_P respectively, then
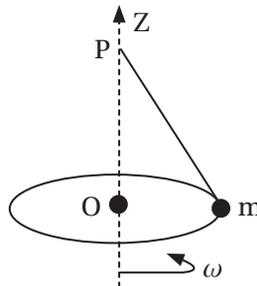
   Ⓐ L_0 and L_P do not vary with time   Ⓑ L_0 varies with time while L_P remains constant

   Ⓒ L_0 remains constant while L_P varies with time   Ⓓ L_0 and L_P both vary with time

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9. A force $\vec{F} = 5\hat{i} + 2\hat{j} - 5\hat{k}$ on a particle whose position vector is $\vec{r} = \hat{i} - 2\hat{j} + \hat{k}$. What is the torque about the origin?

 Ⓐ $8\hat{i} + 10\hat{j} + 12\hat{k}$ Ⓑ $8\hat{i} + 10\hat{j} - 12\hat{k}$ © $8\hat{i} - 10\hat{j} - 8\hat{k}$ Ⓓ $10\hat{i} - 10\hat{j} - \hat{k}$

10. Which of the following points is the likely positions of the centre of mass of the system shown in figure?
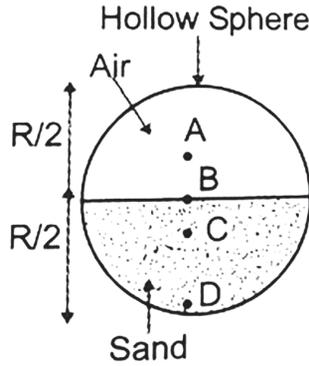
 Ⓐ A   Ⓑ B   © C   Ⓓ D

11. If w_1, w_2 and w_3 are the work done in moving a particle from A and B along three different path 1, 2 and 3 respectively (as shown) in the gravitational field of a point mass m, the relation between w_1, w_2 and w_3 is
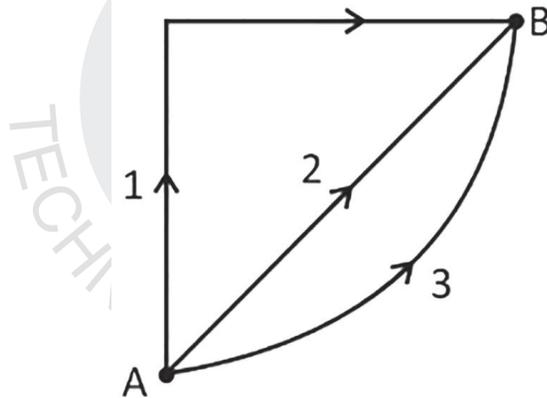

 Ⓐ $w_1 > w_2 > w_3$ Ⓑ $w_1 = w_2 = w_3$ © $w_1 < w_2 < w_3$ Ⓓ $w_2 > w_1 > w_3$

12. Amongst the given graphs which one correctly represents the variation of kinetic energy (K) of a body with velocity (V)?


13. A pebble is attached to one end of a string and rotated in a verticle circle. If string breaks at the position of maximum tension, so from the figure shown below, it will break at
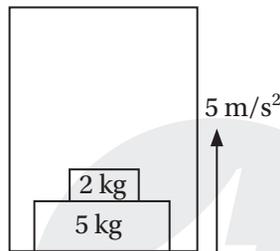
 Ⓐ A

 Ⓑ B

 © C

 Ⓓ D

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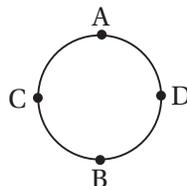
14. The force F acting on a particle of mass m is indicated by the force-time graph shown below. The change in momentum of the particle overs the time internal from 0 to 8 S is
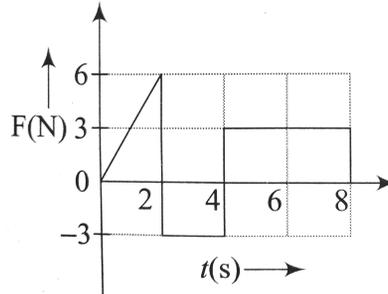
Ⓐ 24 N–S   Ⓑ 20 N–S   Ⓒ 12 N–S   Ⓓ 6 N–S

15. Find the force exerted by 5 kg block on floor of lift, as shown in figure. (Take, $g = 10$ m/s^2)

Ⓐ 100 N   Ⓑ 115 N   Ⓒ 105 N   Ⓓ 135 N

ASSERTION AND REASON (16–19):

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.

16. Assertion: For a system of particles under central force field, the total angular momentum is conserved.

Reason: The torque acting on such a system is zero.

Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

17. Assertion: A spring of force constant K is cut into two pieces having length in the ratio 1 : 2. The force constant of series combination of the two part is 2K/3.

Reason: The spring connected in series are represented by $K = K_1 + K_2$.

Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

18. Assertion: There is no loss in energy in elastic collision.

Reason: Linear momentum is conserved in elastic collision.

Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

19. Assertion: At highest point of a projectile, dot product of velocity and acceleration is zero.

Reason: At highest point, velocity and acceleration are mutually perpendicular.

Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

Case–Based Questions (20–22):

Consider a system consisting of two blocks. Block A with mass 2 kg and block B with a mass 3 kg positioned at $x_A = 2m$ and $x_B = 5$ m respectively along a straight line.

20. What is the positioned of the centre of mass of the system?

Ⓐ 3 m   Ⓑ 3.8 m   Ⓒ 4 m   Ⓓ 5 m

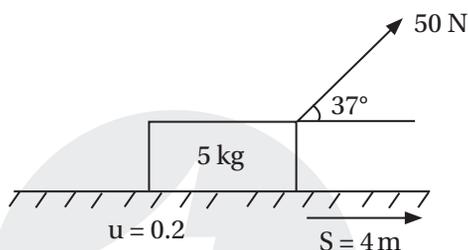21. If block A move to $x_A = 4$ m, what will happen to the centre of mass?

Ⓐ it will increase   Ⓑ it will decrease   Ⓒ remain same   Ⓓ it will become 5 m

22. If block B move to $x_B = 6$ m, what will be the position of centre of mass?

Ⓐ 3.6 m   Ⓑ 4 m   Ⓒ 4.4 m   Ⓓ 4.6 m

Case–Based Questions (23–25):

A force of 50 N is applied on a block of mass 5 kg as shown in figure

23. Work done by external force

Ⓐ 200 J   Ⓑ 120 J   Ⓒ 160 J   Ⓓ 0 J

24. Work done by friction force

Ⓐ – 16 J   Ⓑ – 8 J   Ⓒ 16 J   Ⓓ 8 J

25. Work done by normal reaction force

Ⓐ 200 J   Ⓑ 120 J   Ⓒ 80 J   Ⓓ 0 J

Chemistry

26. Which of the following is correct order of metallic character for Si, Be, Mg, Na & P?

Ⓐ P < Si < Be < Na < Mg   Ⓑ P < Si < Be < Mg < Na   Ⓒ Na > Be > Mg > Si > P   Ⓓ Na > Si > Mg > Be > P

27. The first four ionization energy values of an element are 191, 578, 872 and 5962 kcal. The number of valence electrons in the element is :

Ⓐ 1   Ⓑ 2   Ⓒ 3   Ⓓ 4

28. Among the elements Ca, Mg, P and Cl, the order of increasing atomic radii is :

Ⓐ Mg < Ca < Cl < P   Ⓑ Cl < P < Mg < Ca   Ⓒ P < Cl < Ca < Mg   Ⓓ Ca < Mg < P < Cl

29. The first ionization potentials (eV) of 'N' and 'O' are respectively

Ⓐ 8.29, 8.29   Ⓑ 11.32, 11.32   Ⓒ 8.29, 11.32   Ⓓ 11.32, 8.21

30. The $Z_{effective}$ for He is

Ⓐ 2   Ⓑ 1.7   Ⓒ 1.85   Ⓓ 1.65

31. Correct order of electron affinity is

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

32. Electronegativity of an element on Mulliken scale is 'X' times to that on Pauling scale. What is the value of 'X'?

Ⓐ 2.8   Ⓑ 4   Ⓒ 1   Ⓓ 3.8

33. The diagonal similarities are due to similar polarising powers for the elements. The polarising power is directly proportional to

Ⓐ $\dfrac{\text{ionic charge}}{\text{ionic radius}}$ Ⓑ $\dfrac{(\text{ionic charge})^2}{\text{ionic radius}}$ Ⓒ $\dfrac{\text{ionic charge}}{(\text{ionic radius})^2}$ Ⓓ $\dfrac{\text{ionic charge}}{(\text{ionic radius})^{1/2}}$

34. The increasing order of atomic radii of the following Group 13 elements is

Ⓐ Al < Ga < In < Tl   Ⓑ Ga < Al < In < Tl   Ⓒ Al < In < Ga < Tl   Ⓓ Al < Ga < Tl < In

35. In dsp^2 type of hybridisation the 'd' orbital is

Ⓐ dxy Ⓑ dz^2 Ⓒ dx^2-y^2 Ⓓ none of these

Assertion-Reason Based Questions: (Q. 36 to Q. 39)

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):** Polarisation is the distortion of the shape of an anion by an adjacently placed cation.

Reason (R): Polarisation is brought about by a cation of high charge.

Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

37. **Assertion (A):** PH_3 and PF_3 are pyramidal in shape with one lone pair on 'p', but PF_3 has greater bond angle than PH_3.

Reason (R): Back bonding is present in PF_3 but absent in PH_3.

Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

38. **Assertion (A):** Boiling point of H_2O is more than ethyl alcohol.

Reason (R): Intermolecular hydrozen bonding in H_2O is stronger than ethyl alcohol.

Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

39. **Assertion (A):** In LiCl, more covalent character is present than in LiF.

Reason (R): Polarizability of Cl^- is more than F^-.

Ⓐ a   Ⓑ b   Ⓒ c   Ⓓ d

40. The number of unpaired electrons in O_2 molecule is :

Ⓐ 0   Ⓑ 1   Ⓒ 2   Ⓓ 3

41. Shape of XeF_4 is :

Ⓐ spherical   Ⓑ t.b.p.   Ⓒ square planar   Ⓓ tetrahedral

42. Mole fraction of the solute in a 1.00 molal aqueous solution is :

Ⓐ 1.770   Ⓑ 0.1770   Ⓒ 0.0177   Ⓓ 0.0344

43. When an electron of charge 'e' and mass 'm' moves with velocity 'v' about the nuclear charge 'Ze' in circular orbit of radius 'r', the potential energy is :
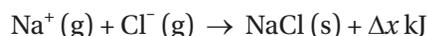
Ⓐ $\dfrac{Ze^2}{r}$ Ⓑ $\dfrac{-Ze^2}{r}$ Ⓒ $\dfrac{Ze^2}{r^2}$ Ⓓ $\dfrac{mv^2}{r}$

44. The hydrogen atom energy of electron in 2nd Bohr's orbit is –3.4 eV. The K.E. of electron in this orbit is :

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

Case Based Type Questions–I: (Q. 45 to Q. 47)

Lattice energy: "It is the amount of energy released when one mole of ionic compound is formed from its gaseous ions."

$Na^+ (g) + Cl^- (g) \rightarrow NaCl (s) + \Delta x \text{ kJ}$

Lattice energy also depend on the 3–D arrangement of ion.

Choose the correct answer.

45. Which of the following has the highest lattice energy?

Ⓐ MgO   Ⓑ NaCl   Ⓒ CaO   Ⓓ KCl

46. In the given compounds least lattice energy is present in

Ⓐ AgF   Ⓑ AgBr   Ⓒ AgCl   Ⓓ NaCl

47. LiF is insoluble in water due to

Ⓐ Low hydration energy   Ⓑ High hydration energy

Ⓒ Low lattice energy   Ⓓ High lattice energy

Case Based Type Questions–II : (Q. 48 - Q. 50)

Shape of the compound depend on type and number of electron pair around central atom. These electron pair repel each other and stay as far as possible. The repulsion sequence is as :

L.P—L.P > L.P—B.P > B.P—B.P

Choose the correct answer :

48. Choose the incorrect match :

Compound		Structure	
(a)	$SnCl_2$	1.	Linear
(b)	CO_2	2.	Linear
(c)	I_3^-	3.	Linear
(d)	N_3^-	4.	Linear

Ⓐ (a)—1.   Ⓑ (b)—2.

Ⓒ (c)—3.   Ⓓ (d)—4.

49. Which of the given compound is planar?

Ⓐ XeF_5^- Ⓑ XeF_4 Ⓒ ICl_4^- Ⓓ All of these

50. dz^2 orbital take part in hybridization

Ⓐ dsp^3 Ⓑ sp^3d^2 Ⓒ d^2sp^3 Ⓓ All of these

Mathematics

51. Solve : $|x-1|+|x-2|+|x-3| \geq 6$

Ⓐ $(-\infty,0] \cup [4,\infty)$ Ⓑ $(-\infty,1] \cup [4,\infty)$ Ⓒ $(-\infty,0] \cup [2,\infty)$ Ⓓ $(-\infty,1] \cup [3,\infty)$

52. The digit in the unit place of the number $183! + 3^{183}$ is

Ⓐ 0   Ⓑ 3   Ⓒ 6   Ⓓ 7

53. If $\alpha = \cos(2\pi/7) + i\sin(2\pi/7)$, then the quadratic equation whose roots are $P = \alpha + \alpha^2 + \alpha^4$ and $Q = \alpha^3 + \alpha^5 + \alpha^6$ is _____

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

54. From 6 different novels and 3 different dictionaries, 4 novels and a dictionary are to be selected and arranged in a row on the shelf such that the dictionary is in the middle. What is the number of such arrangements?

Ⓐ 840   Ⓑ 1080   Ⓒ 879   Ⓓ 850

55. If $\sin\theta$, $\sqrt{2}(\sin\theta+1)$, $6\sin\theta+6$ are in GP then the fifth term is

Ⓐ 81   Ⓑ $81\sqrt{2}$ Ⓒ 162   Ⓓ $162\sqrt{2}$

Case Study Based Questions–I (Q.56–Q.58):

Ms. Khushi and Mr. Daksh decide to construct a Pascal triangle with the help of binomial theorem. They use the formula for the expansion is

$$(a+b)^n = \sum_{r=0}^{n} \binom{n}{r} a^{n-r} b^r$$

On basis of this information given in passage answer the following questions.

56. The coefficient of $x^k (0 \leq k \leq n)$ in the expansion of $E = 1 + (1+x) + (1+x)^2 + \ldots (1+x)^n$ is :

Ⓐ $^{n+1}C_{k+1}$ Ⓑ ^nC_k Ⓒ $^{n+1}C_{n-k-1}$ Ⓓ none of these

57. The coefficient of y in the expansion of $\left(y^2 + \dfrac{c}{y}\right)^5$

Ⓐ $10c^3$ Ⓑ $20c^2$ Ⓒ $10c$ Ⓓ $20c$

58. The sum of coefficient of even powers of x in the expansion of $\left(x - \dfrac{1}{x}\right)^{11}$ is

Ⓐ $11 \times {}^{11}C_5$ Ⓑ $\dfrac{11}{2} \times {}^{11}C_6$ Ⓒ $11({}^{11}C_5 + {}^{11}C_6)$ Ⓓ 0

Case Study Based Questions–II (Q.59 – Q.61):

Sumit works at a book shop. While arranging some books on the book shelf, he observed that there are 5 History books, 3 Mathematics books and 4 Science books which are to be arranged on the shelf.

On the basis of this answer the following questions.

59. In how many ways can he select either a history or a maths book?

    Ⓐ 10   Ⓑ 8   Ⓒ 20   Ⓓ 60

60. If he selects 2 History books, 1 Math book and 1 Science book to arrange them, then find the number of ways in which selection can be made.

    Ⓐ 120   Ⓑ 220   Ⓒ 240   Ⓓ 260

61. In how many ways 3 mathematics books, 4 history books, 3 chemistry books and 2 biology books can be arranged on a shelf so that all books of the same subjects are together?

    Ⓐ 41472   Ⓑ 42000   Ⓒ 30000   Ⓓ 50208

Assertion Reasoning Based Questions [Q.62–Q.65] :

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

62. **Assertion (A) :** $|3x-5|>9 \implies x \in \left(-\infty, \dfrac{-4}{3}\right) \cup \left(\dfrac{14}{3}, \infty\right)$

    Reason (R) : The region containing all the solutions of an inequality is called the solution region.

    Ⓐ (a)   Ⓑ (b)   Ⓒ (c)   Ⓓ (d)

63. **Assertion (A) :** Number of rectangles on a chess board is ${}^8C_2 \times {}^8C_2$.

    Reason (R) : To form a rectangle, we have to select any two of the horizontal line and any two of the vertical line.

    Ⓐ (a)   Ⓑ (b)   Ⓒ (c)   Ⓓ (d)

64. **Assertion (A) :** Number of terms in the expansion of $\left(\sqrt{x}+\sqrt{y}\right)^{10}+\left(\sqrt{x}-\sqrt{y}\right)^{10}$ is 6.

    Reason (R) : If n is even, then the expansion of $\{(x+a)^n + (x-a)^n\}$ has $\left(\dfrac{n}{2}+1\right)$ terms.

    Ⓐ (a)   Ⓑ (b)   Ⓒ (c)   Ⓓ (d)

65. **Assertion (A) :** If the sum of first n terms of a sequence is $an^2 + bn$, then the sequence is an arithmetic progression.

Reason (R) : A sequence is arithmetic if its n-th term is a linear expression in n.

  Ⓐ (a)   Ⓑ (b)   Ⓒ (c)   Ⓓ (d)

66. If $x = 3 + 4i$ (where, $i = \sqrt{-1}$), the value of $x^4 - 12x^3 + 70x^2 - 204x + 225$, is

  Ⓐ –45   Ⓑ 0   Ⓒ 35   Ⓓ 15

67. The roots of the equation $\left(a + \sqrt{b}\right)^{x^2 - 15} + \left(a - \sqrt{b}\right)^{x^2 - 15} = 2a$, where $a^2 - b = 1$, are

  Ⓐ $\pm 2, \pm\sqrt{3}$ Ⓑ $\pm 4, \pm\sqrt{14}$ Ⓒ $\pm 3, \pm\sqrt{5}$ Ⓓ $\pm 6, \pm\sqrt{20}$

68. For any three positive real numbers a, b and c, $9(25a^2 + b^2) + 25(c^2 - 3ac) = 15b(3a + c)$. Then

  Ⓐ a, b and c are in GP   Ⓑ b, c and a are in GP

  Ⓒ b, c and a are in AP   Ⓓ a, b and c are in AP

69. If all the words (with or without meaning) having five letters, formed using the letters of the word SMALL and arranged as in a dictionary, then the position of the word SMALL is

  Ⓐ 59th Ⓑ 52nd Ⓒ 58th Ⓓ 46th

70. If the coefficients of x^3 and x^4 in the expansion of $(1 + ax + bx^2)(1 - 2x)^{18}$ in powers of x are both zero, then (a, b) is equal to

  Ⓐ $\left(14, \dfrac{272}{3}\right)$ Ⓑ $\left(16, \dfrac{272}{3}\right)$ Ⓒ $\left(14, \dfrac{251}{3}\right)$ Ⓓ $\left(16, \dfrac{251}{3}\right)$

71. Solution set of $x - \sqrt{1 - |x|} < 0$ is

  Ⓐ $\left[-1, \dfrac{-1 + \sqrt{5}}{2}\right)$ Ⓑ $[-1, 1]$ Ⓒ $\left[-1, \dfrac{-1 + \sqrt{5}}{2}\right]$ Ⓓ $\left(-1, \dfrac{-1 + \sqrt{5}}{2}\right)$

72. The sets S and E are defined as given below :

$S = \{(x, y) : |x - 3| < 1 \text{ and } |y - 3| < 1\}$ and $E = \{(x, y) : 4x^2 + 9y^2 - 32x - 54y + 109 \le 0\}$. Then

  Ⓐ $S \subset E$ Ⓑ $E \subset S$

  Ⓒ $E = S$ Ⓓ $S \subseteq E$

73. If $\sin x + \sin^2 x = 1$, $x \in \left(0, \dfrac{\pi}{2}\right)$, then $\left(\cos^{12} x + \tan^{12} x\right) + 3\left(\cos^{10} x + \tan^{10} x + \cos^8 x + \tan^8 x\right) + \left(\cos^6 x + \tan^6 x\right)$ is equal to

  Ⓐ 3   Ⓑ 4   Ⓒ 2   Ⓓ 1

74. The number of integral terms in the expansion of $\left(5^{\frac{1}{2}} + 7^{\frac{1}{8}}\right)^{1016}$ is

  Ⓐ 127   Ⓑ 128   Ⓒ 130   Ⓓ 129

75. Let $a_1, a_2, a_3, \ldots$ be a G.P. of increasing positive numbers. If $a_3 a_5 = 729$ and $a_2 + a_4 = \dfrac{111}{4}$, then $24(a_1 + a_2 + a_3)$ is equal to

  Ⓐ 128   Ⓑ 129   Ⓒ 131   Ⓓ 130

Biology

76. Which of the following is against the rules of ICBN?
   Ⓐ Handwritten scientific names should be underlined.
   Ⓑ Every species should have a generic name and a specific epithet.
   Ⓒ Scientific names are in Latin and should be italicised.
   Ⓓ Generic and specific names should start with capital letters.

77. Match the following columns and choose the correct combination from the given options.

	Column I (Kingdoms)		Column II (Classes)
A.	Plantae	1.	Archaebacteria
B.	Fungi	2.	Euglenoids
C.	Protista	3.	Phycomycetes
D.	Monera	4.	Algae

   Ⓐ A–4; B–3; C–2; D–1 Ⓑ A–1; B–2; C–3; D–4 Ⓒ A–3; B–4; C–2; D–1 Ⓓ A–4; B–3; C–1; D–2

78. Which of the following organisms are known as chief producers in the oceans?
   Ⓐ Cyanobacteria Ⓑ Diatoms Ⓒ Dinoflagellates Ⓓ Euglenoids

79. Which plant group has vascular tissue, produces spores, but does not have seeds?
   Ⓐ Bryophyta Ⓑ Pteridophyta Ⓒ Gymnosperms Ⓓ Angiosperms

80. Which one of the following statements is incorrect?
   Ⓐ Mesoglea is present between ectoderm and endoderm in *Obelia*.
   Ⓑ Radial symmetry is found in *Asterias*.
   Ⓒ *Fasciola* is pseudocoelomate.
   Ⓓ *Taenia* is a triploblastic animal.

81. The term 'polyadelphous' is related to—
   Ⓐ Gynoecium Ⓑ Androecium Ⓒ Corolla Ⓓ Calyx

82. Ovary is half inferior in the flower of :
   Ⓐ guava Ⓑ plum Ⓒ brinjal Ⓓ cucumber

83. Choose the correct option for monocotyledonous root.
   Ⓐ Pith is large and well developed Ⓑ No secondary growth
   Ⓒ Polyarch condition Ⓓ All of the above

84. Which of the following statement is incorrect about the circulatory system of frog?
   Ⓐ It is of closed type Ⓑ Incomplete double circulation
   Ⓒ It comprises of heart, blood and blood vessels Ⓓ None of the above

85. Vascular bundle is enclosed within a well developed sclerenchymatous sheath in
   Ⓐ monocot stem Ⓑ dicot stem Ⓒ monocot root Ⓓ dicot root

86. Select a sessile flower from the following :
   Ⓐ Sunflower Ⓑ Tuberose Ⓒ Rose Ⓓ China rose

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87. Select the correct statement :
    Ⓐ The axis of a compound leaf is called rachis.
    Ⓑ Compound leaves have axillary buds at the axil of each leaflet.
    Ⓒ Rose shows palmately compound leaves.
    Ⓓ In pinnately compound leaves, rachis is not present.

88. Inulin is a polymer of
    Ⓐ Glucose   Ⓑ Fructose   Ⓒ Lactose   Ⓓ Starch

89. DNA is a
    Ⓐ Nucleic acid containing deoxy ribose sugar   Ⓑ Variant of polysaccharides
    Ⓒ Primary protein   Ⓓ None of the above

90. The first discovered enzyme was :
    Ⓐ Zymase   Ⓑ Invertase   Ⓒ Ptyalin   Ⓓ Ligase

Assertion Reasoning Based Questions (Q. 91 to Q 94)

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 Assertion and Reason are true and Reason is the correct explanation of the Assertion
B. Both Assertion and Reason are true but Reason is not the correct explanation of the Assertion
C. Assertion is true, but Reason is false
D. Assertion is false, but Reason is true

91. **Assertion**—Mesosomes are equal to mitochondria in eukaryotes.
    Reason—These structures participate in aerobic cellular respiration in prokaryotes.
    Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

92. **Assertion**—The prokaryotic ribosomes are 70S while the eukaryotic ribosomes are 80S.
    Reason—'S' stands for sedimentation coefficient which is indirectly a measure of density and size.
    Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

93. **Assertion**—Starch is a polymer of glucose.
    Reason—It is made up of several glucose units.
    Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

94. **Assertion**—Nine amino acids are referred to as essential amino acids for humans.
    Reason—These are synthesised in the human body.
   Ⓐ A   Ⓑ B   Ⓒ C   Ⓓ D

Observe the given diagram and answer the following questions (95–97)

95. In the G0 phase of the cell cycle,
    Ⓐ the cell is metabolically inactive
    Ⓑ division occurs at a faster rate
    Ⓒ the cell is metabolically active
    Ⓓ cytokinesis occurs

96. The daughter cells formed after M phase have
    Ⓐ increased number of chromosomes
    Ⓑ same amount of DNA as in G1 phase
    Ⓒ decreased amount of DNA than in G1 phase
    Ⓓ decreased number of chromosomes

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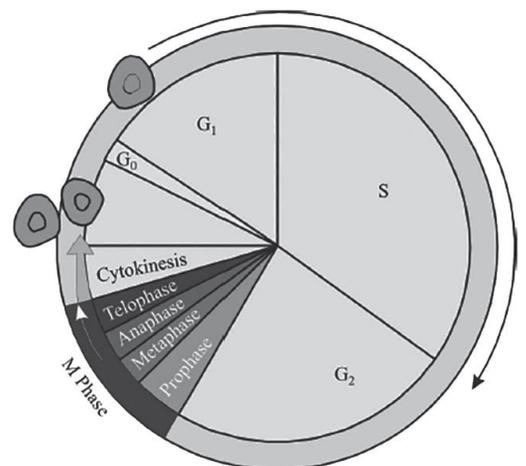
97. Genetic material undergoes duplication during :

Ⓐ G1 phase   Ⓑ G2 phase   Ⓒ S phase   Ⓓ M phase

Read the given passage and answer the following questions : (Q. 98 to Q. 100)

Lysosomes are specialised cell organelles present in the cytoplasm. These are common in animal cells, but also found in plant cells. Lysosomes is surrounded by a single unit membrane, which encloses a dense stroma and a large vacuole, which contains about 50 hydrolytic enzymes. These enzymes can digest most of the biological substances. Lysosomes exist in four forms, such as primary lysosomes, secondary lysosomes, residual bodies and autophagosomes.

98. Which of the following sequence is correct regarding the origin of lysosomes?

Ⓐ ER → Golgi body → Lysosomes   Ⓑ Golgi body → ER → Lysosomes

Ⓒ Nucleus → Golgi body → Lysosomes   Ⓓ Mitochondria → ER → Golgi body → Lysosomes

99. Lysosomes have acidic environment inside their vesicles due to

Ⓐ production of carboxylate ions inside it   Ⓑ production of phosphate ions inside it

Ⓒ high pH compared to outside   Ⓓ None of the above

100. Which of the following statements is not correct?

Ⓐ Lysosomes have numerous hydrolytic enzymes   Ⓑ They are usually found in animal cells

Ⓒ Lysosomes are membrane bound structures   Ⓓ Lysosomes do not show polymorphism