



Monthly Progressive Test

Class: IX

Subject: PCMB



Test Booklet No.: MPT-06

Test Date:

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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 MPT06 16012026.
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 scibble 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.

Space For Rough Works

Physics

1. A car starts from rest and attains a velocity of 20 m/s in 10 s. The acceleration is
 (A) 1 m/s^2 (B) 2 m/s^2 (C) 4 m/s^2 (D) 5 m/s^2
2. A body covers 120 m in 6 s with uniform velocity. Speed is:
 (A) 10 m/s (B) 15 m/s (C) 20 m/s (D) 25 m/s
3. A force of 10 N acts on a body of mass 2 kg. Acceleration is:
 (A) 2 m/s^2 (B) 5 m/s^2 (C) 10 m/s^2 (D) 20 m/s^2
4. Work done by a force of 20 N over 5 m is:
 (A) 20 J (B) 50 J (C) 100 J (D) 200 J
5. Kinetic energy of a 4 kg body moving at 5 m/s is:
 (A) 25 J (B) 40 J (C) 50 J (D) 100 J
6. Work done in lifting a 5 kg mass through 4 m is:
 (A) 100 J (B) 150 J (C) 200 J (D) 250 J
7. Gravitational force depends on:
 (A) Mass (B) Distance (C) Mass and distance (D) Volume
8. Value of g on Earth is:
 (A) 8.9 ms^{-2} (B) 9.8 ms^{-2} (C) 10.8 ms^{-2} (D) 12 ms^{-2}
9. Momentum of 2 Kg mass moving at 3 m/s is:
 (A) 2 Kg ms^{-1} (B) 3 Kg ms^{-1} (C) 5 Kg ms^{-1} (D) 6 Kg ms^{-1}
10. Time period of sound of frequency 200 Hz is:
 (A) 0.002 s (B) 0.005 s (C) 0.02 s (D) 0.2 s
11. Speed of sound is maximum in:
 (A) Air (B) Water (C) Vacuum (D) Solid
12. Quantity constant in uniform circular motion:
 (A) Velocity (B) Speed (C) Direction (D) Acceleration
13. A body returns to Earth due to:
 (A) Air resistance (B) Magnetic force (C) Gravitation (D) Friction
14. SI unit of work is:
 (A) Newton (B) Joule (C) Watt (D) Pascal
15. Loudness depends on:
 (A) Frequency (B) Speed (C) Amplitude (D) Pitch

Assertion and Reason Based Questions (Q. 16 - 19)

- (A) Assertion is true, Reason is true, Reason is a correct explanation of Assertion.
- (B) Assertion is true, Reason is true, Reason is not a correct explanation of Assertion.

© Assertion is true, Reason is false.

Ⓓ Assertion is false, Reason is true.

16. **Assertion :** A body at rest can have energy.

Reason : It may have potential energy.

Ⓐ A

Ⓑ B

Ⓒ C

Ⓓ D

17. **Assertion (A) :** Sound cannot travel through vacuum.

Reason (R) : Sound requires a medium.

Ⓐ A

Ⓑ B

Ⓒ C

Ⓓ D

18. **Assertion :** Action and reaction act on different bodies.

Reason : They are equal and opposite.

Ⓐ A

Ⓑ B

Ⓒ C

Ⓓ D

19. **Assertion (A) :** Weight on Moon is less.

Reason (R) : Gravity on Moon is weaker.

Ⓐ A

Ⓑ B

Ⓒ C

Ⓓ D

Case Study Based Questions (Q. 16 – 19)

Case Study 1: A bus accelerates uniformly at 2 m/s^2 from rest.

20. Velocity after 10 s is:

Ⓐ 10 m/s

Ⓑ 15 m/s

Ⓒ 25 m/s

Ⓓ Distance

21. Distance covered in 10 s is:

Ⓐ 50 m

Ⓑ 100 m

Ⓒ 150 m

Ⓓ 200 m

22. Momentum if mass is 1000 Kg ms^{-1}

Ⓐ $1 \times 10 \text{ Kg ms}^{-1}$

Ⓑ $2 \times 10 \text{ Kg ms}^{-1}$

Ⓒ $3 \times 10 \text{ Kg ms}^{-1}$

Ⓓ $4 \times 10 \text{ Kg ms}^{-1}$

23. Wavelength is:

Ⓐ 1 m

Ⓑ 2 m

Ⓒ 3 m

Ⓓ 4 m

Case Study 2: Sound travels at 340 m/s with frequency 170 Hz .

24. Time period is:

Ⓐ 0.006 s

Ⓑ 0.0059 s

Ⓒ 0.005 s

Ⓓ 0.004 s

25. Type of sound is:

Ⓐ Infrasonic

Ⓑ Audible

Ⓒ Ultrasonic

Ⓓ Supersonic

Chemistry

26. Alum is :

Ⓐ a colloid

Ⓑ double salt

Ⓒ sugar

Ⓓ rock

27. Identify mixture which can be separated by magnetic separation method ?

Ⓐ Chalk powder + sand

Ⓑ Iron + sand

Ⓒ common salt + sand

Ⓓ sulphur + sand

28. The property of true solution is :
 (A) homogeneous (B) heterogenous (C) translucent (D) unstable
29. Aqueous solution of barium chloride reacts with aqueous solution of :
 (A) hydrochloric acid (B) sodium chloride (C) sodium sulphate (D) Sodium bromide
30. If the formula of respective chlorides of 'X' and 'Y' are XCl_3 and YCl_2 , respectively, then the valencies of 'X' and 'Y' are :
 (A) 3 & 2 (B) 3 & 4 (C) 1 & 1 (D) 1 & 4
31. How much heat is needed to convert 12g of ice at 0°C to 12g of water at 0°C ?
 (A) 840 cal (B) 840 joule (C) 960 cal (D) 800 Joule
32. Identify the Isotopes from the following
 (A) ${}_1\text{H}^1, {}_2\text{He}^4$ (B) ${}_{18}\text{Ar}^{40}, {}_{20}\text{Ca}^{40}$ (C) ${}_6\text{C}^{12}, {}_6\text{C}^{13}$ (D) ${}_6\text{C}^{12}, {}_7\text{N}^{13}$
33. In case of which element, the outer most shell is N-shell?
 (A) Sulphur (B) Argon (C) Calcium (D) Magnesium

Assertion & Reason Based Question (Q./ 34–37)

- (A) Assertion is true, Reason is true, Reason is a correct explanation of Assertion.
 (B) Assertion is true, Reason is true, Reason is not a correct explanation of Assertion.
 (C) Assertion is true, Reason is false.
 (D) Assertion is false, Reason is true.

34. **Assertion :** According to Sir Rutherford, electrons release energy when it rotates around the nucleus.
Reason : Electrons move around the nucleus in some circular paths.
 (A) A (B) B (C) C (D) D
35. **Assertion :** ${}_2\text{He}^4$ is the lightest element in this world
Reason : ${}_2\text{He}^4$ has equal number of protons, electrons and neutrons
 (A) A (B) B (C) C (D) D
36. **Assertion :** Maximum number of electrons in the K-shell is 4.
Reason : Maximum number of electrons in a shell is $2n^2$.
 (A) A (B) B (C) C (D) D
37. **Assertion :** Chlorine can accept one electron spontaneously.
Reason : On receiving one electron in the outermost shell, chlorine attains its nearest noble gas configuration and that brings the stability.
 (A) A (B) B (C) C (D) D

Case Based Question—I

Average atomic mass is determined by the following formula

$$\text{Average atomic mass} = \frac{\sum(\text{mass of the isotope} \times \text{percentage of abundance in nature})}{100}$$

38. Consider the following data and select the correct average atomic mass of argon

$${}_{18}\text{Ar}^{40} = 99.6\%, {}_{18}\text{Ar}^{36} = 0.337\%, {}_{18}\text{Ar}^{38} = 0.063\%$$

- (A) 39.754 (B) 39.985 (C) 39.656 (D) 39.728

39. Consider the following data and select the correct average atomic mass of neon : $^{20}\text{Ne}_{10} = 90.5\%$, $^{21}\text{Ne}_{10} = 0.27\%$
 $^{22}\text{Ne}_{10} = 9.25\%$
- (A) 20.191 (B) 20.245 (C) 20.003 (D) 20.201
40. On which factor, the average atomic weight does not depend ?
- (A) Mass number (B) atomic number
 (C) Maximum number of electron(s) released during ionization
 (D) Number of all possible isotopes.
41. How many atoms of sulphur are present in 0.1 mole of S_8 molecule (atomic weight of S = 32)
- (A) 2.56×10^{23} atom (B) 1.28×10^{23} atom (C) 4.817×10^{23} atom (D) 48.17×10^{23} atom
42. Calculate the mass of 4 moles of Aluminium atom (Atomic mass of Al = 27)
- (A) 52 g (B) 108 g (C) 27 g (D) 81 g
43. Calculate the total number of electrons in nitrate ion (NO_3^-):
- (A) 63 (B) 30 (C) 32 (D) 33
44. $^{15}\text{X}_7$, $^{11}\text{X}_7$ are two naturally occurring isotopes of an element X. What is the percentage of each isotope of 'X' if the average atomic mass is 14 ?
- (A) 95, 5 (B) 80, 20 (C) 75, 25 (D) 65, 25
45. Atomic models have been improved over the years. Arrange the following atomic models in the order of the chronological order :
- (i) Rutherford's atomic model (ii) Thomson's atomic model (iii) Bohr's atomic model
- (A) (i), (ii) and (iii) (B) (ii), (iii) and (i) (C) (ii), (i) and (iii) (D) (iii), (ii) and (i)
46. Ions are formed due to :
- (A) change of colour of elements (B) transfer of electron(s) to or from
 (C) change of temperature of the elements (D) change of pressure of the elements
47. In tincture of iodine, find the solute and solvent :
- (A) Alcohol is the solute and iodine is the solvent (B) Iodine is the solute and alcohol is the solvent
 (C) Any component can be considered as solute or solvent
 (D) Tincture iodine is not solution

Case Based Question—II (Q. 48 - 50)

Ions are formed by the transfer of electron(s). An anion is formed when an element receives electron(s) and losing the electron(s) cation is formed. Radicals are the combination of different elements in a proper ratio and as a whole there is a charge on it.

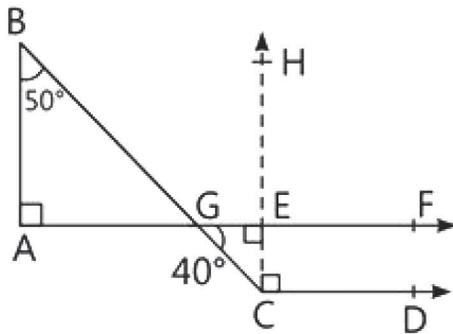
48. which radical contains hydrogen ?
- (A) bisulphate (B) sulphite (C) Nitride (D) Nitrite
49. Sulphate and sulphite radicals differ due to different :
- (A) number of sulphur atoms (B) number of oxygen atoms
 (C) change on the radicals (D) number of hydrogen present in the radicals
50. In which of the following radical, the ratio of the elements is just equal to that in sulphate radical ?
- (A) Nitrate (B) Carbonate (C) Phosphate (D) Nitrite

Mathematics

51. If $x = \frac{1}{2-\sqrt{3}}$, then the value of $x^3 - 2x^2 - 7x + 5$ is
 (A) 2 (B) 1 (C) 0 (D) 3
52. When the polynomial $p(x) = ax^2 + bx + c$ is divided by x , $x - 2$ and $x + 3$, the remainders obtained are 7, 9 and 49 respectively. The value of $(3a + 5b + 2c)$ is
 (A) -5 (B) 5 (C) 2 (D) -2
53. The co-ordinates of point of intersection of lines represented by $x + 4 = 0$ and $y - 1 = 0$ is
 (A) (4, 1) (B) (-4, 1) (C) (-4, -1) (D) (4, -1)
54. The figure formed by the lines $x + y = 2$, $x - y = 2$, $-x + y = 2$ and $x + y = -2$ is
 (A) Square (B) Rhombus (C) Kite (D) Rectangle
55. A point C is called the midpoint of a line segment AB, if
 (A) C is an interior point of AB (B) $AC = CB$
 (C) C is an interior point of AB such that $AC = CB$ (D) $AC + CB = AB$

CASE STUDY BASED QUESTION- I (Q.56- Q. 58):

Satyam was playing with torch. He put mirrors at different places and threw torch light over them. When he threw light, it got reflected as shown below in geometrical figure.



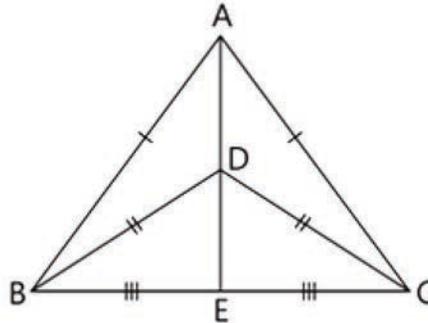
On the basis of the above information, solve the following questions.

56. Which of the following set of points is a collinear?
 (A) G, E, H (B) B, A, G (C) G, E, F (D) E, C, D
57. The degree measure of $\angle BGA$ is:
 (A) 55° (B) 60° (C) 50° (D) 40°
58. The degree measure of $\angle BGE$ is:
 (A) 140° (B) 45° (C) 50° (D) 55°

CASE STUDY BASED QUESTION- II (Q.59 - Q. 61):

Sunil is a farmer who is having a triangular plot. As the land is limited with him, so he decided to divide his land in four parts so that he can use multiple cropping method in which fields are growing with different seeds. The field is divided as shown below.

In this figure, $\triangle ABC$ and $\triangle DBC$ are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC . Line AD is extended to BC , which intersect at point E .



On basis of the above information answer the following questions.

59. If Sunil decides to grow crop in $\triangle ABD$, then which of the other triangle is of exact shape and size?

- Ⓐ $\triangle ABD \cong \triangle ACD$ Ⓑ $\triangle ABD \cong \triangle BDE$ Ⓒ $\triangle ABD \cong \triangle ACE$ Ⓓ $\triangle ACD \cong \triangle AEB$

60. In $\triangle BDC$, if $\angle B + \angle D + \angle C = 180^\circ$, $\angle D = 70^\circ$, then $\angle B$ is equal to

- Ⓐ 70° Ⓑ 60° Ⓒ 55° Ⓓ 80°

61. Which of the following pair is congruent?

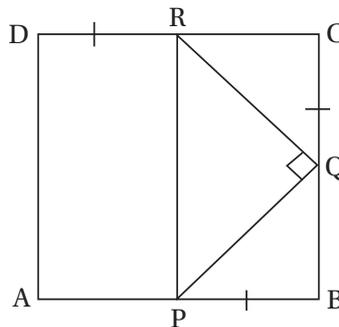
- Ⓐ $\triangle ABE$ and $\triangle ADC$ Ⓑ $\triangle ABE$ and $\triangle ACE$ Ⓒ $\triangle AEC$ and $\triangle ADB$ Ⓓ $\triangle ABE$ and $\triangle ABD$

ASSERTION-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:

- Both A and R are true and R is the correct explanation of A.
- Both A and R are true but R is not the correct explanation of A.
- A is true but R is false.
- A is false but R is true.

62. **Assertion (A):** In the given figure, $ABCD$ is a square $\angle PQR = 90^\circ$. If $PB = QC = DR$, then $\angle QPR = 45^\circ$.



Reason (R): Sum of four angles of a quadrilateral is 360° .

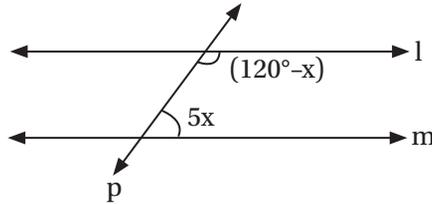
- Ⓐ a Ⓑ b Ⓒ c Ⓓ d

63. **Assertion (A):** The diagonals of a rhombus bisect each other at right angle.

Reason (R): A rhombus is a quadrilateral with all sides equal.

- Ⓐ a Ⓑ b Ⓒ c Ⓓ d

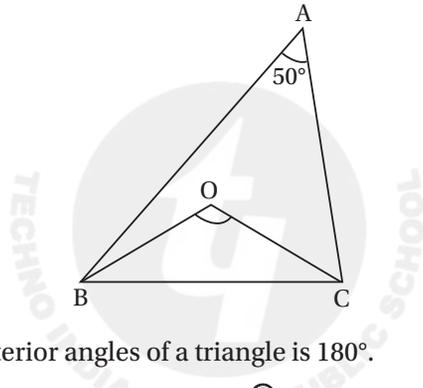
64. **Assertion (A):** The value of x from the adjoining figure, if $l \parallel m$ is 15° .



Reason (R): If two parallel lines are intersected by a transversal, then each pair of corresponding angles so formed is equal.

- Ⓐ a Ⓑ b Ⓒ c Ⓓ d

65. **Assertion (A):** In the given figure, BO and CO are the bisectors of $\angle B$ and $\angle C$ respectively. If $\angle A = 50^\circ$, then $\angle BOC = 115^\circ$.



Reason (R): The sum of all the interior angles of a triangle is 180° .

- Ⓐ a Ⓑ b Ⓒ c Ⓓ d

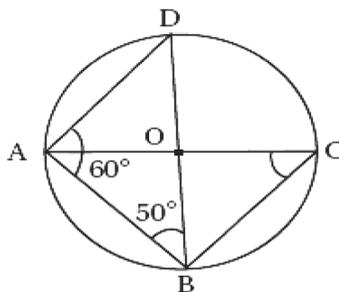
66. The solution set of the system of equations $\frac{4}{x} + 5y = 7$, $\frac{3}{x} + 4y = 5$ is

- Ⓐ $(\frac{1}{3}, -1)$ Ⓑ $(-\frac{1}{3}, 1)$ Ⓒ $(-\frac{1}{3}, -1)$ Ⓓ $(\frac{1}{3}, 1)$

67. The remainder when $f(x) = x^{45} + x^{25} + x^{14} + x^9 + x$ is divided by $g(x) = x^2 - 1$, is

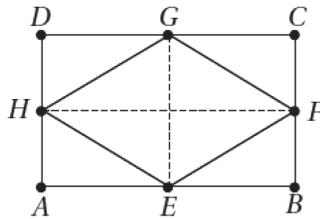
- Ⓐ $4x - 1$ Ⓑ $4x + 2$ Ⓒ $4x + 1$ Ⓓ $4x - 2$

68. Find $\angle ACB$.

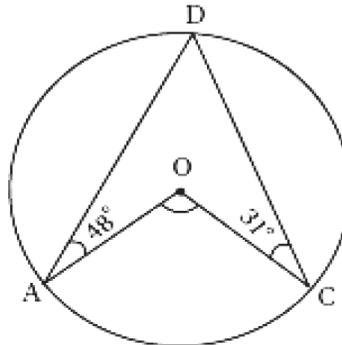


- Ⓐ 50° Ⓑ 60° Ⓒ 80° Ⓓ 70°

69. The area of a triangle is 150 cm^2 and its sides are in the ratio 3 : 4 : 5. What is its perimeter?
 (A) 10 cm (B) 30 cm (C) 45 cm (D) 60 cm
70. The sum of the radius of the base and height of a solid cylinder is 37 cm. If the total surface area of the solid cylinder is 1628 cm^2 . The volume of the cylinder is
 (A) 4600 cm^3 (B) 4620 cm^3 (C) 4640 cm^3 (D) none of these
71. Range of the data 6, 1, 2, 3, 9, 8, 3, 4, 8, 2, 3 is:
 (A) 4 (B) 8 (C) 7 (D) 2
72. The mid-points of AB and AC of a ΔABC are respectively X and Y. If $BC + XY = 12$ units, then the value of $BC - XY$ is
 (A) 6 (B) 8 (C) 4 (D) 12
73. The figure obtained by joining the midpoints of the adjacent sides of a rectangle of sides 16 cm and 12 cm is



- (A) a rectangle of area 98 cm^2 (B) a square of area 48 cm^2
 (C) a trapezium of area 54 cm^2 (D) a rhombus of area 96 cm^2
74. $\angle AOC = ?$



- (A) 136° (B) 145° (C) 157° (D) none of these
75. If $2x = a + a^{-1}$ and $2y = b + b^{-1}$, then the value of $xy + \sqrt{(x^2 - 1)(y^2 - 1)}$ is
 (A) $2\left(ab + \frac{1}{ab}\right)$ (B) $\frac{1}{2}\left(ab + \frac{1}{ab}\right)$ (C) $\left(ab + \frac{1}{ab}\right)$ (D) 0

Biology

76. A student observes a cell under a microscope after plasmolysis. Which structure will be most affected first?
 (A) Cell wall (B) Cytoplasm (C) Vacuole (D) Plasma membrane
77. Which statement is incorrect about mitochondria?
 (A) They are double-membrane bound (B) Inner membrane forms cristae
 (C) They contain their own DNA (D) They are present in all prokaryotes

78. If ribosomes are destroyed in a cell, which function will stop immediately?
 (A) Respiration (B) Protein synthesis (C) Lipid synthesis (D) Photosynthesis
79. Which cell organelle is correctly matched with its function?
 (A) Golgi body – protein synthesis (B) Lysosome – intracellular digestion
 (C) ER – ATP synthesis (D) Ribosome – lipid formation
80. A cell placed in a hypotonic solution will:
 (A) Shrink (B) Burst in animal cells
 (C) Remain unchanged (D) Burst in plant cells
81. Which plant tissue provides both mechanical support and flexibility?
 (A) Parenchyma (B) Collenchyma (C) Sclerenchyma (D) Xylem
82. Which cell is dead at maturity but still conducts water?
 (A) Tracheids (B) Phloem fibres (C) Sieve tubes (D) Companion cells
83. Identify the incorrect pair:
 (A) Xylem – water transport (B) Phloem – food transport
 (C) Epidermis – storage of food (D) Sclerenchyma – rigidity
84. Which animal tissue is dead?
 (A) Bone (B) Cartilage (C) Areolar tissue (D) None of the above
85. The cells of which muscle tissue is spindle shaped with a central nucleus?
 (A) Striated (B) Smooth (C) Cardiac (D) None of the above
86. Permanent tissues are so-called because:
 (A) They divide rapidly (B) They lose ability to divide and are differentiated
 (C) They store food (D) They conduct water
87. Which tissue connects muscles to bones?
 (A) Ligament (B) Tendon (C) Cartilage (D) Areolar
88. In an animal cell, which structure serves as the barrier between the cytoplasm the external environment?
 (A) Cell wall (B) Mitochondrial membrane
 (C) Plasma membrane (D) Tonoplast
89. Which tissue shows striations and voluntary control?
 (A) Smooth muscle (B) Cardiac muscle (C) Skeletal muscle (D) Connective tissue
90. Which organelle is called the “suicidal bag” of the cell and why?
 (A) Golgi – packaging (B) Lysosome – digestive enzymes
 (C) Ribosome – protein synthesis (D) ER – transport

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** – Mixed cropping reduces the risk of total crop failure.
Reason – Different crops have different resistance to diseases and pests.
 Ⓐ A Ⓑ B Ⓒ C Ⓓ D
92. **Assertion** – Use of HYV seeds alone cannot guarantee high yield.
Reason – HYV seeds require proper irrigation, fertilizers, and pest control.
 Ⓐ A Ⓑ B Ⓒ C Ⓓ D
93. **Assertion** – Organic farming improves soil fertility in the long run.
Reason – Organic manures increase humus content and microbial activity.
 Ⓐ A Ⓑ B Ⓒ C Ⓓ D
94. **Assertion** – Animal husbandry increases the food production capacity of a country.
Reason – It provides milk, eggs, meat, and improves draught power.
 Ⓐ A Ⓑ B Ⓒ C Ⓓ D

Case based Question (95-97):

Read the given passage and answer the following questions:

A girl fell down while running and felt pain near her knee joint. Her doctor said that the fibres that connect bone to bone were stretched and slightly torn. She was in pain and could not go to school for a couple of days.

95. Which tissue was damaged?
 Ⓐ Epithelial tissue Ⓑ Ligament Ⓒ Tendon Ⓓ Cartilage
96. The tissue which was damaged is an example of _____.
 Ⓐ Epithelial tissue Ⓑ Muscular tissue Ⓒ Connective tissue Ⓓ Nervous tissue
97. Certain tissues help repair injured parts and fill spaces around organs. Identify this tissue.
 Ⓐ Muscular Ⓑ Cartilage Ⓒ Areolar tissue Ⓓ Bone

Case Based Question (98-100):

Read the given passage and answer the following questions:

A student is studying practices that increase food production without harming the environment. She reads about organic farming, integrated farming, and the need for proper fertilizer and manure use. She reads about how some agricultural practices can harm soil health and hence, productivity of crops.

98. Which of the following is a natural way to improve soil nutrients?
 Ⓐ Using chemical fertilizers Ⓑ Using synthetic pesticides
 Ⓒ Using organic manure Ⓓ Burning crop residues
99. What is one main drawback of excessive fertilizer use?
 Ⓐ Reduces soil fertility permanently Ⓑ Produces foul odour
 Ⓒ Reduces water content in plants Ⓓ Reduces pest attacks permanently
100. Why are legumes often included in organic crop rotation practices?
 Ⓐ They deplete nitrogen from the soil Ⓑ They increase soil acidity
 Ⓒ They make the soil compact Ⓓ They fix atmospheric nitrogen