



# Monthly Progressive Test

Class: X

Subject: PCMB



Test Booklet No.: MPT010

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 MPT1010022025.
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.

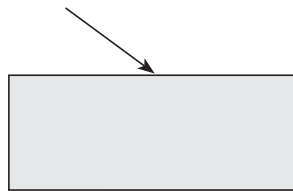
## Space For Rough Works

# Physics

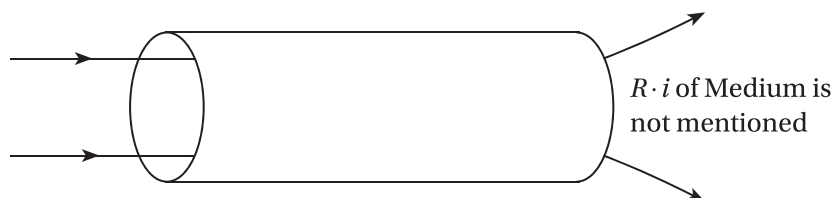
1. The speed of light is shown in the figure by the point  $A$ . The point  $O$  represents zero speed. The point on the line representing speed of sound should be drawn



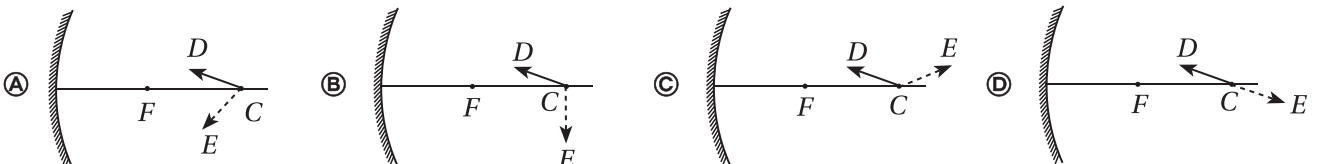
- (A) just to the right of  $O$                       (B) at the middle of  $O$  and  $A$   
 (C) just to the left of  $A$                       (D) to the right of  $A$
2. Light falls obliquely on the surface of a thick glass slab as shown in the figure. Which statement among the following is correct?



- (A) Light stops at the surface  
 (B) Light reflects at the surface but does not refract  
 (C) Light refracts at the surface but does not reflect  
 (D) A part of the light reflects at the surface and a part of it refracts
3. A real image of a point object is formed in a mirror when
- (A) the incident rays actually intersect                      (B) the reflected rays actually intersect  
 (C) the incident rays seem to diverge from a point                      (D) the reflected rays seem to diverge from a point
4. A lens is fitted inside a tube. A parallel beam of light enters the tube, goes through the lens and emerges as a divergent beam, as shown in figure. The lens in the tube



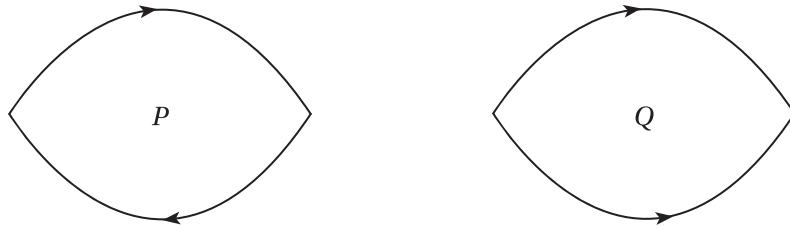
- (A) must be concave                      (B) must be convex  
 (C) may be convex or concave                      (D) cannot produce the emergent beam
5. The four figures below show a concave mirror whose focus is  $F$  and the centre of curvature is  $C$ .  $CD$  is an object. Which figure correctly represents its image  $CE$ ?



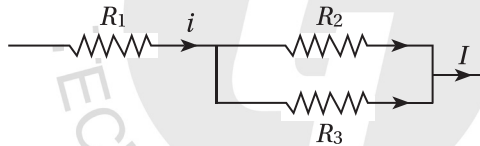
6. Light passes from a medium  $A$  to another medium  $B$  without bending at the interface. Which of the following is not possible?
- (A)  $A$  and  $B$  have the same refractive index and light falls on the interface obliquely.
  - (B)  $A$  and  $B$  have the same refractive index and light falls on the interface perpendicularly.
  - (C)  $A$  and  $B$  have different refractive indices and light falls normally on the interface
  - (D)  $A$  and  $B$  have different refractive indices and light falls obliquely on the interface.
7. When a convex lens forms an image whose size is equal to that of the object, the object is placed
- (A) at a distance less than  $f$
  - (B) between  $f$  and  $2f$
  - (C) at  $2f$
  - (D) beyond  $2f$
8. A convex lens forms an image some distance away from the lens. If the image is erect, the object is placed
- (A) at a distance less than  $f$
  - (B) between  $f$  and  $2f$
  - (C) at  $2f$
  - (D) beyond  $2f$
9. The power of a convex lens of focal length 5 cm is
- (A) +20 D
  - (B) +50 D
  - (C) -20 D
  - (D) -50 D
10. The ability of the eye to adjust the focal length of the eye-lens to form sharp images is called
- (A) distinct vision
  - (B) dilation
  - (C) accommodation
  - (D) hyperopia
11.  $1 \text{ coulomb} \times 1 \dots = 1 \text{ joule}$ . The missing word is
- (A) volt
  - (B) ampere
  - (C) ohm
  - (D) watt
12. The direction of current in a wire is
- (A) the same as the direction of the flow of electrons through the wire
  - (B) opposite to the direction of flow of the electrons through the wire
  - (C) the same as the direction of flow of the neutrons through the wire
  - (D) opposite to the direction of flow of neutrons through the wire
13. Ampere is the same as
- (A) volt/second
  - (B) watt/second
  - (C) joule/second
  - (D) coulomb/second
14. To get a constant nonzero potential difference between the two contacts of a bulb, we should join the contacts to
- (A) a copper wire
  - (B) a plastic wire
  - (C) an electrical socket in your house
  - (D) the terminals of a battery
15. Carbon is a
- (A) conductor in its graphite form but insulator in its diamond form
  - (B) insulator in its graphite form but conductor in its diamond form
  - (C) conductor in both its graphite and diamond forms
  - (D) insulator in both its graphite and diamond forms
16. Pick the correct statement
- (A) An electric field has a direction and so does a magnetic field.
  - (B) An electric field has a direction, but a magnetic field does not.
  - (C) A magnetic field has a direction, but an electric field does not.
  - (D) Neither an electric field nor a magnetic field has a direction.

[3]

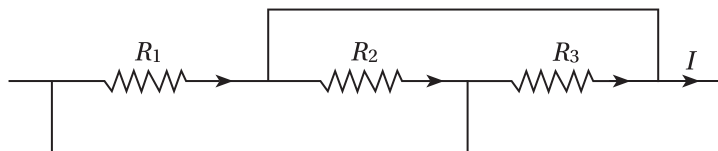
17. For the figure given below, which statement is correct?



- (A) Both  $P$  and  $Q$  can represent a magnetic field line.  
(B)  $P$  can represent a magnetic field line, but  $Q$  cannot  
(C)  $Q$  can represent a magnetic field line, but  $P$  cannot  
(D) Neither can represent a magnetic field line
18. Consider a bar magnet placed in a lab. The magnetic field due to this magnet  
(A) will exist outside the magnet, but not inside it      (B) will exist inside the magnet, but not outside it  
(C) will exist both outside and inside the magnet      (D) will exist only near the ends
19. (●) is the symbol for  
(A) a resistor      (B) a fuse      (C) a bulb      (D) a plug key (ON)
20. Look at the figure below and pick the correct statement



- (A)  $R_1$  and  $R_2$  are connected in series      (B)  $R_1$  and  $R_2$  are connected in parallel  
(C)  $R_2$  and  $R_3$  are connected in series      (D)  $R_2$  and  $R_3$  are connected in parallel
21. Look at the figure below and pick the correct statement.



- (A)  $R_1$ ,  $R_2$  and  $R_3$  are joined in series  
(B)  $R_1$ ,  $R_2$  and  $R_3$  are joined in parallel  
(C)  $R_1$ ,  $R_2$  are joined in series, and  $R_3$  is joined in parallel to their combination.  
(D)  $R_1$ ,  $R_2$  are joined in parallel, and  $R_3$  is joined in series with their combination.
- Assertion and Reason (Q22-Q23)**

**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.

- 22. Assertion:** The poles of an electromagnet get switched if the current is reversed.  
**Reason:** The magnetic field outside a current carrying solenoid is parallel to the axis of solenoid.  
 (A) A (B) B (C) C (D) D
- 23. Assertion:** The resistance of a wire is directly proportional to the area of cross-section of conductor.  
**Reason:** The resistance of a wire is directly proportional to length of the conductor.  
 (A) A (B) B (C) C (D) D

### Case based questions

A battery connected to a resistance supplies a current of 4 A. The emf of battery connected is 8 volt. The circuit is ohmic. One ideal ammeter is connected to the circuit in series. A voltmeter is connected across the resistor.

- 24.** If an equal resistance is connected in parallel with the first resistance, the current supplied by the battery will be  
 (A) 15 A (B) 10 A (C) 8 A (D) 5 A
- 25.** If an equal resistance is connected in series with the first resistance, the current supplied by the battery will be  
 (A) 10 A (B) 8 A (C) 4 A (D) 2 A

## Chemistry

- 26.** I.U.P.A.C. name of tertiary butyl alcohol is :  
 (A) 2,2-dimethyl ethanol (B) 2-methyl butanol (C) 2-methyl propanol (D) 2-methyl propan-2-ol
- 27.** The hydrocarbon used for welding purpose is :  
 (A) ethane (B) ethylene (C) acetylene (D) benzene
- 28.** What is the basicity of hypophosphorous acid?  
 (A) 1 (B) 2 (C) 3 (D) 4
- 29.** Isomerization of ethyne at 600°C in presence of copper tube gives :  
 (A) polyethene (B) polyethyne (C) benzene (D) polyvinylchloride
- 30.** Name the metals present in type metal :  
 (A) Fe, Sn, C (B) Zn, Pb, Cu (C) Pb, Sb, Sn (D) Cu, Sn, Pb
- 31.** Bleaching powder  $[Ca(OCl)Cl]$  is an example of :  
 (A) acid (B) double salt (C) complex salt (D) mixed salt
- 32.** Match the oxides given in Column-I with their nature given in Column-II and select the correct option given below :

Column I (oxides)		Column II (Nature of oxides)	
a.	SO <sub>2</sub>	1.	Basic oxide
b.	H <sub>2</sub> O	2.	Acidic oxide
c.	Al <sub>2</sub> O <sub>3</sub>	3.	Neutral oxide
d.	CaO	4.	Amphoteric oxide

- (A) a-2; b-3; c-1; d-4 (B) a-1; b-4; c-2; d-3  
 (C) a-2; b-3; c-4; d-1 (D) a-3; b-2; c-4; d-1

33. \_\_\_\_\_ gas is evolved when Mn reacts with very dilute nitric acid.  
 (A) NO<sub>2</sub> (B) N<sub>2</sub>O (C) NO (D) H<sub>2</sub>
34. The only non-metallic liquid at room temperature is :  
 (A) Hg (B) Ga (C) Br<sub>2</sub> (D) Cl<sub>2</sub>
35. The combination of carbon monoxide and hydrogen is known as :  
 (A) Carbon gas (B) Coal gas (C) Producer gas (D) Water gas
36. Identify 'X' and 'Y' in the following reaction :  
 $\text{Ca(OH)}_2 (\text{aq}) + \text{X} (\text{g}) \rightarrow \text{CaCl}_2 (\text{s}) + \text{Y} + 2\text{NH}_3 (\text{g})$   
 (A) X = NH<sub>4</sub>Cl, Y = O<sub>2</sub> (B) X = NH<sub>4</sub>Cl, Y = H<sub>2</sub>O  
 (C) X = (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>, Y = SO<sub>2</sub> (D) X = NH<sub>4</sub>OH, Y = O<sub>2</sub>
37. Chemical formula of Glauber's salt is :  
 (A) Na<sub>2</sub>CO<sub>3</sub> · 10H<sub>2</sub>O (B) Na<sub>2</sub>SO<sub>4</sub> · 5H<sub>2</sub>O (C) Na<sub>2</sub>SO<sub>4</sub> · 10H<sub>2</sub>O (D) MgSO<sub>4</sub> · 7H<sub>2</sub>O
38. Plaster of paris containing packets are properly sealed. Because when it comes contact with air then :  
 (A) white colour changes into yellow (B) it absorbs water vapour and becomes liquid  
 (C) it becomes very hard as gypsum is formed (D) it starts to release sulphur dioxide
39. Which is the next homologous compound of methanal?  
 (A) Ethanol (B) Ethanoic acid (C) Propanal (D) Ethanal
40. Which of the following alloys contain non-metal as one of their constituents?  
 (A) Brass (B) Steel (C) Bronze (D) Amalgam

### Assertion-Reason Based Questions (Q41-Q44)

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

41. **Assertion (A):** Ionic compounds generally have high melting points.

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

- (A) A (B) B (C) C (D) D

42. **Assertion (A):** Reactivity series is an arrangement of element based on their reactivity.

**Reason (R):** Reactivity series is used to separate elements based on their reactivity.

- (A) A (B) B (C) C (D) D

43. **Assertion (A):** General formula of alkyne C<sub>n</sub>H<sub>2n-2</sub>

**Reason (R):** Benzene is an aromatic compound.

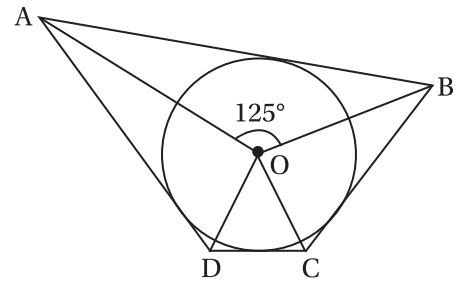
- (A) A (B) B (C) C (D) D





53. In fig., if  $\angle AOB = 125^\circ$ , then  $\angle COD$  is equal to

- (A)  $62.5^\circ$   
 (B)  $45^\circ$   
 (C)  $35^\circ$   
 (D)  $55^\circ$



54. The sum of first 25 even natural numbers is

- (A) 600                      (B) 650                      (C) 625                      (D) 620

55. Two cubes each of volume  $27 \text{ cm}^3$  are joined together. Find the surface area of the resulting solid?

- (A)  $109.4 \text{ cm}^2$               (B)  $126 \text{ cm}^2$               (C)  $90 \text{ cm}^2$               (D)  $189.4 \text{ cm}^2$

56. If  $\sin \theta + \sin^2 \theta = 1$ , then  $\cos^2 \theta + \cos^4 \theta =$

- (A) -1                      (B) 0                      (C) 1                      (D) 2

57. In two triangles, DEF and PQR,  $\angle D = \angle Q$  and  $\angle R = \angle E$ , then which of the following is not true?

- (A)  $\frac{EF}{PR} = \frac{DF}{PQ}$                       (B)  $\frac{EF}{RP} = \frac{DE}{PQ}$   
 (C)  $\frac{DE}{QR} = \frac{DF}{PQ}$                       (D)  $\frac{EF}{RP} = \frac{DE}{QR}$

58. If  $p(x) = ax^2 + bx + c$  and  $a + b + c = 0$ , then one zero is

- (A)  $-\frac{b}{a}$                       (B)  $\frac{c}{a}$                       (C)  $\frac{b}{c}$                       (D) none of these

59. If the median of 21 observations is 40 and if the observations greater than the median are increased by 5 then the median of the new data will be

- (A) 45                      (B) 40                      (C) 41                      (D) 42

60. If  $\sum f_i = 17$ ,  $\sum f_i x_i = 3p + 63$  and mean = 6, then p is

- (A) 14                      (B) 12                      (C) 13                      (D) 11

61. What will be the value of k, if the roots of the equation  $(k - 4)x^2 - 2kx + (k + 5) = 0$  are equal?

- (A) 18                      (B) 19                      (C) 20                      (D) 21

62. In  $\triangle OPQ$ , right-angled at P,  $OP = 7 \text{ cm}$  and  $OQ - PQ = 1 \text{ cm}$ , then the value of  $\sin Q$

- (A)  $\frac{7}{25}$                       (B)  $\frac{24}{25}$                       (C) 1                      (D) none of these

63. Find the surface area of the given solid which is in the form of a cone mounted on a hemisphere. The radius and height of the cone are 5cm and 12cm.

- (A)  $214.4 \text{ cm}^2$               (B)  $279.53 \text{ cm}^2$               (C)  $361.43 \text{ cm}^2$               (D)  $72.5 \text{ cm}^2$

64. What is the probability of a spade card if a card is drawn at random from a well shuffled deck of 52 cards?

- (A)  $\frac{1}{26}$                       (B)  $\frac{5}{26}$                       (C)  $\frac{3}{26}$                       (D)  $\frac{1}{4}$

65. In what ratio does the point  $\left(-\frac{19}{3}, \frac{7}{3}\right)$  divide the line segment joining A(3, 7) and B(-11, 0)?
- (A) 3 : 2                      (B) 2 : 3                      (C) 2 : 5                      (D) 2 : 1

■ **Case-Study Based Questions (66-68):**

An ice-cream seller used to sell different kinds and different shapes of ice-cream like rectangular shaped with one end hemispherical, cone-shaped and rectangular brick, etc. One day Sheetal and her brother came to his shop. Sheetal purchased an ice-cream which has the following shape: ice-cream cone as the union of a right circular cone and a hemisphere that has the same (circular) base as the cone. The height of the cone is 9 cm and the radius of its base is 2.5 cm. Her brother purchased rectangular brick shaped ice cream with length 9 cm, width 4cm and thickness 2 cm.



Based on the above information, answer the following questions.

66. The volume of ice-cream without hemispherical end is
- (A)  $\frac{825}{14} \text{ cm}^3$                       (B)  $\frac{827}{14} \text{ cm}^3$                       (C)  $\frac{225}{7} \text{ cm}^3$                       (D) none of these
67. The volume of the ice-cream with a hemispherical end is
- (A)  $\frac{225}{3} \text{ cm}^3$                       (B)  $\frac{275}{3} \text{ cm}^3$                       (C)  $\frac{225}{7} \text{ cm}^3$                       (D)  $\frac{225}{14} \text{ cm}^3$
68. The volume of her brother's ice cream is
- (A)  $72 \text{ cm}^3$                       (B)  $82 \text{ cm}^3$                       (C)  $75 \text{ cm}^3$                       (D)  $73 \text{ cm}^3$

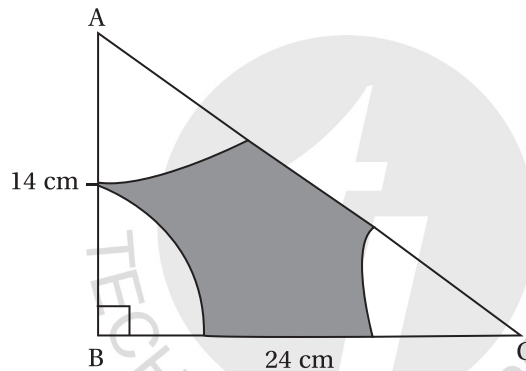
■ **Assertion Reason based Questions (69-70):**

**Directions:** In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (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.
69. **Assertion(A) :** The HCF of 31 and 200 = 1  
**Reason(R) :** The HCF of co-prime numbers is 1.
- (A) a                      (B) b                      (C) c                      (D) d
70. **Assertion(A) :** In a circle of radius 7 cm, the angle of a sector is  $120^\circ$ . Then area of sector is  $\frac{154}{3} \text{ cm}^2$ .  
**Reason(R) :** Area of circle with radius r is  $\pi r^2$ .

- (A) a                      (B) b                      (C) c                      (D) d

71. If mean = 53 and median = 50, then find the mode  
 (A) 40 (B) 44 (C) 45 (D) 48
72. What will be the length of the median through the vertex A, if the coordinates of the vertices of  $\Delta ABC$  are  $A(2, 5)$ ,  $B(5, 0)$ ,  $C(-2, 5)$ ?  
 (A)  $\sqrt{\frac{113}{3}}$  units (B)  $\sqrt{\frac{13}{2}}$  units (C)  $\sqrt{\frac{113}{2}}$  units (D)  $\sqrt{\frac{13}{3}}$  units
73. The probability that tomorrow will be a sunny day is 0.68, then what is the probability that tomorrow will not be a sunny day?  
 (A) 0.32 (B) 0.64 (C) 0.44 (D) 0.56
74.  $P(x, y)$  is a variable point.  $A(3, 4)$  and  $B(7, 7)$  are two fixed points. Find the least value of  $(PA + PB)$   
 (A) 4 units (B) 3 units (C) 5 units (D) 8 units
75. In figure,  $ABC$  is a triangle right-angled at  $B$ , with  $AB = 14$  cm and  $BC = 24$  cm. With the vertices  $A$ ,  $B$  and  $C$  as centres, arcs are drawn, each of radius 7 cm. Find the area of the shaded region. (Use  $\pi = \frac{22}{7}$ )



- (A)  $90 \text{ cm}^2$  (B)  $92 \text{ cm}^2$  (C)  $91 \text{ cm}^2$  (D)  $94 \text{ cm}^2$

## Biology

76. Name the respiratory substrate of saprophytes  
 (A) Fructose (B) Glycerol  
 (C) Glucose (D) Any biodegradable matter
77. Which part of the alimentary canal of man does not secrete any enzyme?  
 (A) Mouth (B) Oesophagus (C) Stomach (D) Duodenum
78. Chlorophyll is present in/on \_\_\_\_\_  
 (A) stroma of chloroplasts (B) surface of chloroplasts  
 (C) stacks of thylakoid (D) DNA of chloroplasts
79. Concentration of urine depends upon the presence of  
 (A) ADH (B) Thyroxine (C) Oestrogen (D) Insulin
80. A sphygmomanometer measures —  
 (A) Blood volume (B) Rate of breathing  
 (C) Pulse rate (D) Blood pressure

81. Transpiration helps in \_\_\_\_\_ movement of sap through the \_\_\_\_\_.  
Choose the correct pair, in order:
- (A) upward, phloem (B) upward, xylem  
(C) downward, phloem (D) downward, xylem
82. The movement of sunflower in accordance to the path of sun, is due to\_\_\_\_\_
- (A) Phototropism (B) Geotropism  
(C) Hydrotropism (D) Chemotropism
83. The main function of abscisic acid in plants is to—
- (A) Increase the length of cells (B) Promote cell division  
(C) Inhibit growth (D) Promote growth of stem
84. The use of iodised salt is recommended to prevent
- (A) Diabetes (B) Tetany (C) Hypotension (D) Goitre
85. The centre of sense of smell in the brain is
- (A) Midbrain (B) Olfactory lobes (C) Cerebellum (D) Phonoreceptors
86. A multicellular organism, which reproduces asexually by regeneration, is \_\_\_\_\_
- (A) *Planaria* (B) Cockroach (C) *Spirogyra* (D) *Mucor*
87. In fertilization of plants, fusion of a male gamete with two polar nuclei (of the central cell) results in the formation of
- (A) Zygote (B) Seed coat (C) Endosperm (D) Cotyledon
88. The process of release of egg from the ovary is called
- (A) Oogenesis (B) Ovulation (C) Placentation (D) None
89. The allele which is unable to express its effect in the presence of another is called:
- (A) Co-dominant (B) Dominant (C) Recessive (D) None
90. Driving force of an ecosystem is:
- (A) Carbohydrates (B) Biomass (C) ATP (D) Solar energy

■ **Assertion – Reason Based Questions: (91-95):**

- A: Assertion and Reason both are correct and Reason is the correct explanation of Assertion.  
B: Assertion and Reason both are correct but Reason is not the correct explanation of Assertion.  
C: Assertion is correct but Reason is wrong.  
D: Assertion is wrong but Reason is correct.

91. **Assertion:** Skeletal muscle cells respire anaerobically at all times.  
**Reason:** Anaerobic respiration in skeletal muscle cells results in the formation of lactic acid
92. **Assertion:** In tubectomy, the vagina of the female is inserted with copper T.  
**Reason:** Tubectomy is a surgical method of contraception.
93. **Assertion:** The heart is four chambered in birds.  
**Reason:** Blood flows twice through the heart to complete one course of circulation in birds.
94. **Assertion:** The reflex action is a fast and spontaneous response to a stimulus.  
**Reason:** The reflex action does not involve the CNS.
95. **Assertion:** Decomposers show saprophytic mode of nutrition.  
**Reason:** Decomposers can synthesize their own food.

