



# Monthly Progressive Test

Class: IX (S)

Subject: PCMB



Test Booklet No.: MPT05

Test Date: 

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Time: 180 mins

Full Marks: 200

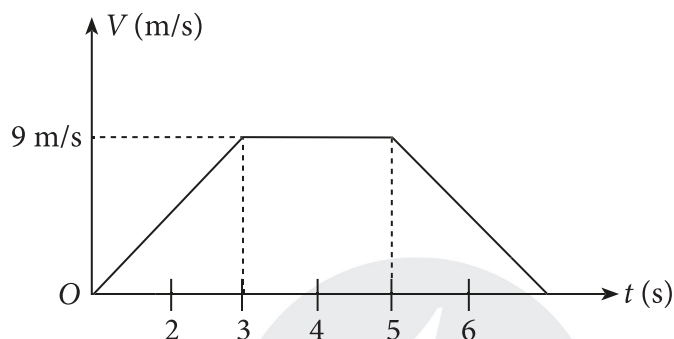
## Important Instructions :

1. The Test is of 180 mins duration and the Test Booklet contains 100 multiple choice questions of single correct option only. There are four sections with four subjects. You have to attempt all 100 questions (Candidates are advised to read all 100 questions). Questions 1 to 25 contain Physics, Questions 26 to 50 contain Chemistry, Questions 51 to 75 contain Mathematics, Questions 76 to 100 contain Biology.
2. Each question carries 2 marks. For each correct response, the candidate will get 2 marks. There is no negative mark for wrong response. The maximum mark is 200.
3. Use Blue / Black Ball point Pen only for writing particulars marking responses on Answer Sheet.
4. Rough work is to be done in the space provided for this purpose in the Test Booklet only.
5. On completion of the test, the candidate must handover the Answer Sheet to the invigilator before leaving the Room / Hall. The candidates are allowed to take away this Test Booklet with them.
6. The CODE for this Booklet is Off Line .
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**



1. A car moving at 10 m/s is to be stopped by applying brakes in the next 4 m. If the car weighs 1000 kg, the average force must be applied on it is equal to  
 (A) 12.5 kN                      (B) 10 kN                      (C) 15 kN                      (D) 20 kN
2. A particle of mass 1 kg moves on a straight line. The variation of speed with time is shown below. Then the force acting on the particle at  $t = 2$  s is equal to



- (A) 4 N                      (B) 5 N                      (C) 6 N                      (D) 3 N
3. If the net force on a body is zero, will it definitely be at rest?  
 (A) Yes  
 (B) Not necessary. This is possible that the body is moving with accelerating velocity  
 (C) Not necessary. This is possible that the body is moving with decelerating velocity  
 (D) Not necessary. This is possible that the body is moving with constant velocity

### Assertion-Reason type Questions (4):

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

- A. If both Assertion and Reason are true and Reason is the correct explanation of the Assertion.
  - B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.
  - C. If Assertion is true but the Reason is false.
  - D. If Assertion is false but Reason is true.
4. **Assertion (A):** A table cloth can be pulled from a table without dislodging the dishes.  
**Reason (R):** To every action there is an equal and opposite reaction.

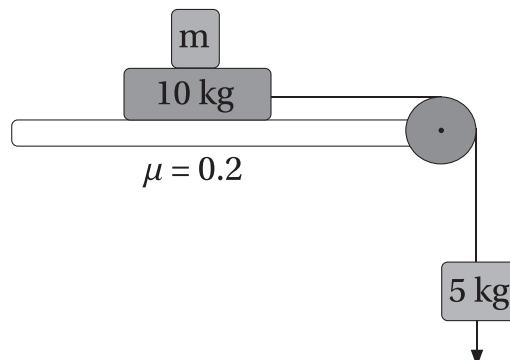
Of these statements:

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

**Passage (5-7):**

Two bodies A and B of masses  $m$  and  $2m$  respectively are moving with equal linear momenta. They are subjected to the same retarding force ( $F$ ) where  $x = \frac{p^2}{2Fm}$  and  $p = mu$ .

5. If  $x_1$  and  $x_2$  are the respective stopping distances then  $x_1/x_2$  is  
 (A)  $\frac{1}{2}$  (B) 1 (C)  $\sqrt{2}$  (D) 2
6. If  $t_1$  and  $t_2$  are the respective time taken by them to stop then  $t_1/t_2$  is [where  $t = \frac{p}{F}$ ]  
 (A) 1 (B) 2 (C)  $\frac{1}{2}$  (D)  $\frac{1}{4}$
7. If  $a_1$  and  $a_2$  are the respective retardations then  $\frac{a_1}{a_2}$  is (where  $a = F/m$ )  
 (A) 1 (B) 2 (C)  $\sqrt{2}$  (D)  $\frac{1}{\sqrt{2}}$
8. A ball is dropped from a height of 1 m. How much time does it need to cover this 1 m? ( $g = 10 \text{ m/s}^2$ )  
 (A)  $\sqrt{2} \text{ s}$  (B)  $\sqrt{0.2} \text{ s}$  (C)  $\sqrt{5} \text{ s}$  (D)  $\sqrt{0.5} \text{ s}$
9. If  $v-t$  graph is straight line passing through origin and making acute angle with time axis, then what is acceleration?  
 (A) Positive (B) Negative (C) Zero (D) None of these
10.  $S = (u + v) \times (?)$  then ? =  
 (A)  $t$  (B)  $\frac{t}{2}$  (C)  $2t$  (D) None of these
11.  $S_n = u + (a/2) \times (2n - 1)$ , state the expression as T/F  
 (A) False (B) True (C) May be false (D) None of these
12. Find minimum value of  $m$  so that the system does not move



- (A) 5 kg (B) 10 kg (C) 15 kg (D) None

13. A person was moving up in a lift. Accidentally the life cord is snapped and the lift started to fall freely.
- Ⓐ The head of the person touches the ceiling of lift
  - Ⓑ The person will feel completely weightless
  - Ⓒ The person will move upwards
  - Ⓓ None of the above

### Assertion-Reason type Questions (14 - 15):

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

- A. If both Assertion and Reason are true and Reason is the correct explanation of the Assertion.
  - B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.
  - C. If Assertion is true but the Reason is false.
  - D. If Assertion is false but Reason is true.
14. **Assertion:** A force of 10 N towards the East and another force 10N balance each other if the second force is acting towards West.
- Reason:** If two forces balance each other, they have to be in the opposite directions and their magnitudes have to be equal.

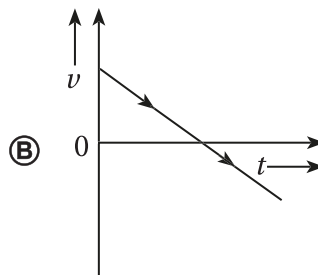
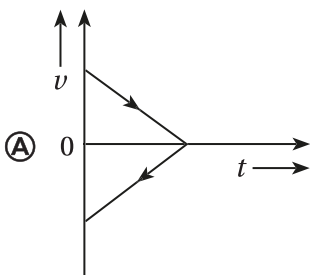
- Ⓐ A                      Ⓑ B                      Ⓒ C                      Ⓓ D

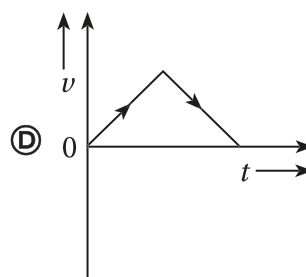
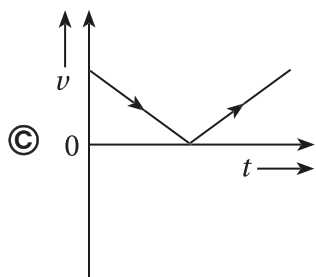
15. **Assertion:** In the equation  $F = ma$ , if we put  $F = 0$ , we get  $a = 0$ .

**Reason:** If no unbalanced force is applied on an object, its acceleration will be zero.

- Ⓐ A                      Ⓑ B                      Ⓒ C                      Ⓓ D

16. A body is thrown vertically upwards. Which one of the following graphs correctly represent the velocity  $v$  vs time?





### Assertion-Reason type Questions (17 – 18):

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

- A. If both Assertion and Reason are true and Reason is the correct explanation of the Assertion.
- B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.
- C. If Assertion is true but the Reason is false.
- D. If Assertion is false but Reason is true.

**17. Assertion:** If we apply a force  $F$  on a body of mass  $2\text{ kg}$ , which produces an acceleration of  $5\text{ m/s}^2$ . To produce the same acceleration in a  $4\text{ kg}$  body, we have to apply a force of  $2F$ .

**Reason:** If acceleration is fixed, then  $F$  is directly proportional to mass of body.

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

**18. Assertion:** When we stand in a bus and the bus starts suddenly, we tend to fall backwards.

**Reason:** The upper part of our body doesn't feel the forward force immediately and remains at rest for a while.

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

### Case Study Based Question (19–20):

**Read the passage given below and answer the following questions.**

To change the velocity of a given body, one has to apply a force. Consider two bodies of unequal masses, say a football and a tennis ball. If we push the two balls with equal effort, both will start moving. Football will gain a smaller velocity than the tennis ball. Football has smaller change in velocity than tennis ball.

**19.** To change the velocity of a given body one has to apply a force. Is it true or false?

- (A) False                      (B) True                      (C) May be true                      (D) None of these

**Case Study Based Question (20):**

Read the passage given below and answer the following question.

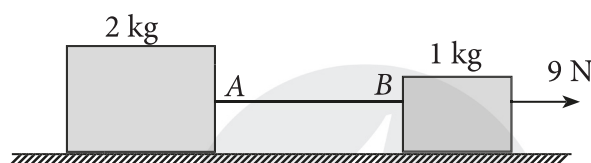
A particle starts from a point with a velocity of  $+6.0 \text{ m/s}$  and moves with an acceleration of  $-2 \text{ m/s}^2$ . After 6 s, the particle will be at the location which can be worked out using equation of kinematics.

20. Find the location after 6 s.

- (A) Starting point  
 (B) +1 m from starting point  
 (C) +2 m from starting point  
 (D) None of these

**Passage (21-25):**

Two blocks of masses 1 kg and 2 kg Connected by string are placed on horizontal smooth surface as shown. A horizontal force 9 N is applied on 1 kg.



21. The common acceleration of the blocks is

- (A)  $3 \text{ m/s}^2$       (B)  $6 \text{ m/s}^2$       (C)  $2 \text{ m/s}^2$       (D) 0

22. The force on 2 kg mass

- (A) 3 N      (B) 6 N      (C) 4 N      (D) 5 N

23. If string AB has uniform mass 1 kg, then common acceleration of the blocks is (in  $\text{m/s}^2$ )

- (A) 1.5      (B) 2.5      (C) 2      (D) 2.25

24. With reference to Q.18 the force at the midpoint of string

- (A) 5.625 N      (B) 4.5 N      (C) 6 N      (D) 3.625 N

25. The linear momentum of 2 kg mass at 2 s is

- (A) 6 N-s      (B) 12 N-s      (C) 18 N-s      (D) 3 N-s

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**Chemistry**

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26. Formula of sodium sulphate will be

- (A)  $\text{Na}_2\text{SO}_4$       (B)  $\text{Na}_3\text{SO}_4$       (C)  $\text{NaSO}_4$       (D)  $\text{Na}_3(\text{SO}_4)_2$

27. What will be the molecular mass of glucose ( $\text{C}_6\text{H}_{12}\text{O}_6$ )

[Atomic mass : C = 12, H = 1, O = 16]

- (A) 189      (B) 173      (C) 180      (D) 185

28. Which of the following is an incorrect statement for an element ?

- Ⓐ A substance with only one kind of atoms
- Ⓑ A substance containing two or more kinds of atoms
- Ⓒ A substance with constant boiling point
- Ⓓ A substance with a definite melting point

Question 29 is **ASSERTION - REASON TYPE** question. Select the correct option

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

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

**OPTION C :** Assertion is correct but reason is wrong

**OPTION D :** Assertion is wrong but reason is correct

29. **Assertion :** The molecular weight of oxygen is 32 amu

**Reason :** The atomic weight of oxygen is 16 amu and oxygen is a diatomic molecule

- Ⓐ A
- Ⓑ B
- Ⓒ C
- Ⓓ D

30. In the laboratory, carbon disulphide is used as a solvent to separate a mixture of iron filings and sulphur powder. What precaution has to be taken with carbon disulphide ?

- Ⓐ Keep away from water
- Ⓑ Keep away from flame
- Ⓒ Keep away from air
- Ⓓ Keep away from iron sulphide

31. Magnetism is most beneficial for separating

- Ⓐ Gases and non-metallic liquids
- Ⓑ Magnetic solids and solids such as sulphur
- Ⓒ Non - magnetic solids and solids such as sulphur
- Ⓓ Non - magnetic solids from non - magnetic liquids

Question 32 is **ASSERTION - REASON TYPE** question. Select the correct option

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

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

**OPTION C :** Assertion is correct but reason is wrong

**OPTION D :** Assertion is wrong but reason is correct



**32. Assertion :** When helium gas is released from a metal tank maintained at a constant temperature, the pressure of the gas decreases

**Reason :** The average distance between the gas molecules decreases

- Ⓐ A                      Ⓑ B                      Ⓒ C                      Ⓓ D

**33.** Find out wrong statements

(I) Oil in water is an example of liquid - liquid homogeneous mixture

(II) Brass is an example of solid - solid heterogeneous mixture

(III) Nitric acid in water is an example of liquid - liquid heterogeneous mixture

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

**34.** X = number of oxygen in nitrate ion, Y = number of oxygen in nitrite ion

Now,  $[(X + Y) - 2] = Q$ . Now, Q is the charge over the cation of which compound ?

- Ⓐ Magnesium sulphate                      Ⓑ Ferric oxide  
Ⓒ Ferrous sulphide                      Ⓓ Calcium bicarbonate

Question 35 to 37 is **ASSERTION - REASON TYPE** question. Select the correct option

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

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

**OPTION C :** Assertion is correct but reason is wrong

**OPTION D :** Assertion is wrong but reason is correct

**35. Assertion :** Evaporation causes cooling

**Reason :** Particles of liquid absorb energy from the surroundings

- Ⓐ A                      Ⓑ B                      Ⓒ C                      Ⓓ D

**36. Assertion :** Chemical formula of zinc oxide is  $ZnO_2$

**Reason :** Valencies of both oxygen and zinc are 2

- Ⓐ A                      Ⓑ B                      Ⓒ C                      Ⓓ D

**37. Assertion :** A mixture is not a pure substance

**Reason :** The simple components of a mixture taken separately are impure

- Ⓐ A                      Ⓑ B                      Ⓒ C                      Ⓓ D

Question 38 and 39 are **CASE BASED QUESTIONS**. Read the passage carefully and select the correct answers

Law of conservation of mass states that the mass of reactant will be just equal to the mass of product. But this law is applicable when the system is closed i.e. none of the products is moving out of the system and none of the reactants is added to the reaction centre.

38. If a reaction is done in the closed container then
- (A) Mass of reactant < mass of product
  - (B) Mass of reactant > mass of product
  - (C) Mass of product at first increases then starts to decrease
  - (D) Mass of reactant is just equal to the mass of product
39. Barium chloride solution is added to sodium sulphate solution. Then the correct statements are
- (I) Mass of both barium chloride and sodium sulphate decreases gradually
  - (II) Mass of product gradually increases
  - (III) White precipitation is obtained
- (A) I, II                      (B) II, III                      (C) I, III                      (D) I, II III
40. Consider the compounds silver (I) carbonate, sodium oxide, magnesium bicarbonate, zinc nitride. In which option, all compounds are represented in a correct manner ?
- (A)  $\text{AgCO}_3$ ,  $\text{Na}_2\text{O}$ ,  $\text{Mg}(\text{HCO}_3)_2$ ,  $\text{Zn}(\text{NO}_2)_2$
  - (B)  $\text{Ag}_2\text{CO}_3$ ,  $\text{Na}_2\text{O}_2$ ,  $\text{Mg}(\text{HCO}_3)_2$ ,  $\text{Zn}_3\text{N}_2$
  - (C)  $\text{Ag}(\text{CO}_3)_2$ ,  $\text{Na}_2\text{O}$ ,  $\text{Mg}_3(\text{HCO}_3)_2$ ,  $\text{Zn}(\text{NO}_3)_2$
  - (D)  $\text{Ag}_2\text{CO}_3$ ,  $\text{Na}_2\text{O}$ ,  $\text{Mg}(\text{HCO}_3)_2$ ,  $\text{Zn}_3\text{N}_2$
41. If the formula of a metal nitrite is  $\text{M}(\text{NO}_2)_2$  then the formula of its dihydrogen phosphate is
- (A)  $\text{M}(\text{PO}_4)$                       (B)  $\text{MHPO}_4$                       (C)  $\text{M}(\text{H}_2\text{PO}_4)_2$                       (D)  $\text{M}_2\text{HPO}_4$
42. Boiling of a liquid takes place at
- (A) a fixed temperature lower than its boiling point
  - (B) a fixed temperature and normal atmospheric pressure
  - (C) a fixed temperature higher than its boiling point
  - (D) a fixed temperature and higher than atmospheric pressure
43. Which of the following is not a chemical change ?
- (A) Passing of steam over red hot coke

- Ⓑ Colour change of dilute nitric acid upon long standing
- Ⓒ Absorption of moisture by  $P_2O_5$
- Ⓓ Absorption of moisture by  $CaCl_2$

44. Which one of the following processes involves fractional distillation ?

X : Separation of components of liquid air

Y : Separation of crude petroleum into useful fractions like gasoline, kerosene oil, diesel etc.

Z : Separation of kerosene oil and water

- Ⓐ X, Y, Z                      Ⓑ X, Y                      Ⓒ X, Z                      Ⓓ Y, Z

45. Which of the following statement is incorrect about ammonium chloride ?

- Ⓐ It is solid at room temperature
- Ⓑ It directly changes to vapour on heating
- Ⓒ It is soluble in water
- Ⓓ It melts at room temperature and changes to liquid

46. At the time of determination of atomic mass of an element, the data of oxygen can be considered. Because

- Ⓐ Oxygen is a colourless gas
- Ⓑ Oxygen is easily available in the atmosphere
- Ⓒ Oxygen can react with large number of elements to form compounds
- Ⓓ Oxygen is the lightest element in the atmosphere

47. In which of the following option, all molecules have same atomicity ?

- Ⓐ Iron (III) nitrate, Zinc (II) carbonate, Magnesium (II) carbonate
- Ⓑ Calcium (II) carbonate, Magnesium (II) carbonate, Zinc (II) carbonate
- Ⓒ Iron (II) nitrate, Calcium (II) nitrate, Sodium (I) nitrate
- Ⓓ Sodium (I) nitrate, Potassium (I) phosphate, Calcium (II) carbonate

48. Consider the given data and select the correct mathematical relationships given below

X = Atomicity of aluminium bicarbonate molecule

Y = Atomicity of aluminium sulphate molecule

Z = Atomicity of calcium phosphate molecule

(I)  $\frac{Y+X}{2} > Z$                       (II)  $Y > X > Z$                       (III)  $\frac{Y+Z}{2} < X$

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

Question 49 and 50 are **TRUE - FALSE TYPE QUESTIONS**. Read the statements carefully and select the correct option [T = True statement and F = False statement]

**49. Statement I :** A colloid is a homogeneous mixture

**Statement II :** The components of colloids cannot be separated by normal filtration method

**Statement III :** In case of emulsion, dispersed phase is gas and dispersing medium is liquid

- (A) FTT                      (B) FTF                      (C) TFT                      (D) FFT

**50. Statement I :** Crystallization is a process that separates a pure solid in the form of crystal from a solution

**Statement II :** Both boron and iodine are solid at room temperature and they are metalloids

**Statement III :** In a mixture, the chemical properties of the components remain unchanged

- (A) FTT                      (B) FFT                      (C) FTF                      (D) TFT

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**Mathematics**

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**51.** In a parallelogram  $ABCD$ ,  $\angle BAD = 75^\circ$ ,  $\angle CBD = 65^\circ$ , then the value of  $\angle BDC$

- (A)  $40^\circ$                       (B)  $45^\circ$                       (C)  $50^\circ$                       (D)  $60^\circ$

**52.** In a trapezium  $ABCD$ ,  $AB \parallel DC$  and  $AB = 7$  cm and  $DC = 5$  cm. If  $E, F$  are the mid-point of  $AD$  and  $BC$  respectively, then the length of  $EF$  is

- (A) 5 cm                      (B) 7 cm                      (C) 6 cm                      (D) 12 cm

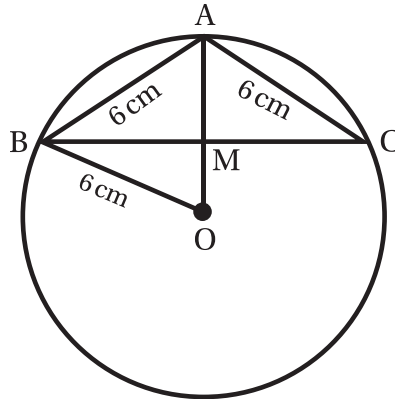
**53.** If the diagonal of a rhombus are 18 cm and 24 cm respectively, then its side is equal to

- (A) 16 cm                      (B) 15 cm                      (C) 20 cm                      (D) 17 cm

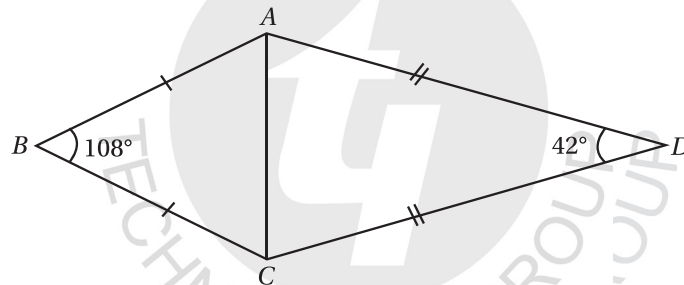
**54.**  $O$  is the centre of the circle having radius 5 cm.  $OM \perp$  on chord  $AB$ . If  $OM = 4$  cm, then the length of the chord  $AB =$

- (A) 6 cm                      (B) 5 cm                      (C) 8 cm                      (D) 10 cm

55.  $O$  is the centre of the circle having radius 5 cm.  $AB$  and  $AC$  are two chords such that  $AB = AC = 6$  cm. If  $OA$  meets  $BC$  perpendicularly at  $M$ , then  $OM =$



- (A) 3.6 cm                      (B) 1.4 cm                      (C) 2 cm                      (D) 3 cm
56. In the following figure,  $ABCD$  is a quadrilateral in which  $AB = BC$  and  $AD = DC$ . The measure of  $\angle BCD$  is



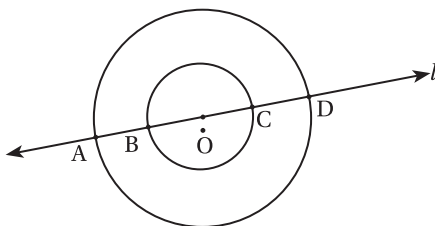
- (A)  $30^\circ$                       (B)  $105^\circ$                       (C)  $150^\circ$                       (D)  $72^\circ$
57. If  $O$  is the incenter of a triangle  $ABC$  and  $\angle BAC = 40^\circ$ , then  $\angle BOC$  is
- (A)  $80^\circ$                       (B)  $110^\circ$                       (C)  $140^\circ$                       (D)  $40^\circ$

### Assertion Reason based Questions (58–59):

**Directions:** In this question, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choice.

- (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.

58. **Assertion (A)** : If a line  $l$  intersects two concentric circles at the points A, B, C and D, then  $AB = CD$ .



**Reason (R)** : Perpendicular drawn from the centre bisects the chord.

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

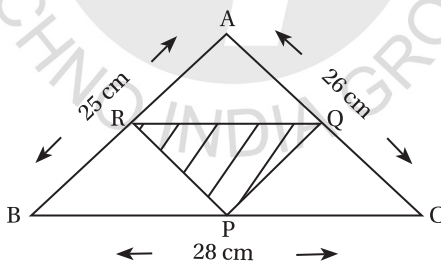
59. **Assertion (A)** : A rectangle with one side of length 4 cm is inscribed in a circle of diameter 5cm. Then the area of the rectangle is  $20 \text{ cm}^2$ .

**Reason (R)** : Area of the rectangle = length  $\times$  breadth.

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

**Case Study Based Questions (60–62):**

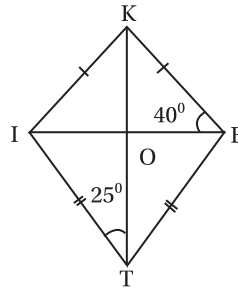
There is a Diwali celebration in the TIGPS unit. Girls are asked to prepare Rangoli in a triangular shape. They made a Rangoli in the shape of triangle ABC. Dimensions of  $\Delta ABC$  are 26cm, 28 cm, 25 cm.



From the above informations answer the following questions :

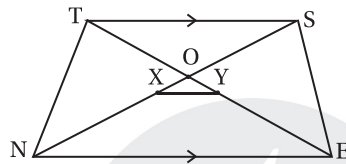
60. If R is mid-point of AB and  $RQ \parallel BC$ , then AQ is equal to  
 (A) QC                      (B) RB                      (C) BC                      (D) AR
61. If R and Q are mid-points of AB and AC respectively, then RQ is equal to  
 (A) 13 cm                      (B) 15 cm                      (C) 14 cm                      (D) 12.5 cm
62. If a garland is to be placed along the side of  $\Delta QPR$  which is formed by joining mid-points, what is the length of garland?  
 (A) 39.5 cm                      (B) 49.5 cm                      (C) 35 cm                      (D) 79 cm

63. In adjoining figure KITE find  $\angle KIT$ .



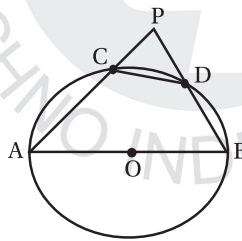
- (A)  $105^\circ$                       (B)  $110^\circ$                       (C)  $115^\circ$                       (D)  $120^\circ$

64. NEST is a trapezium.  $NX = XS$  and  $EY = YT$  then  $XY = ?$



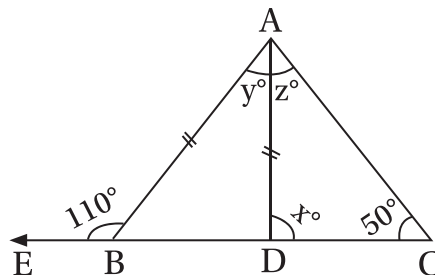
- (A)  $\frac{1}{2} NE$                       (B)  $\frac{1}{2} TS$                       (C)  $\frac{1}{2} (NE + TS)$                       (D)  $\frac{1}{2} (NE - TS)$

65. In this figure, AOB is a diameter and  $CD = OB$  then  $\angle APB$  is



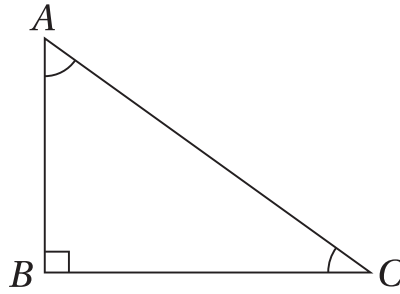
- (A)  $30^\circ$                       (B)  $60^\circ$                       (C)  $90^\circ$                       (D)  $45^\circ$

66. In figure given below find  $z$ .



- (A) 20                      (B) 110                      (C) 45                      (D) None of these

67. In  $\triangle ABC$ ,  $\angle B = 90^\circ$  and  $\angle C = 2\angle A$ . The correct relation is



- (A)  $AC = 2AB$       (B)  $AC = 2BC$       (C)  $AC = 3AB$       (D)  $AC = 3BC$

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

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

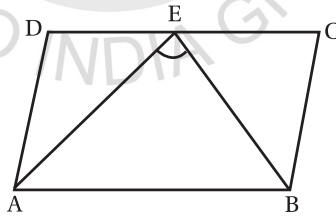
69. If  $a + b + c = 12$  and  $a^2 + b^2 + c^2 = 50$ , find the value of  $ab + bc + ca$ .

- (A) 44      (B) 45      (C) 46      (D) 47

70. If  $\sqrt{x} + \frac{1}{\sqrt{x}} = 2$ , then the value of  $x^8 + \frac{1}{x^8}$  is

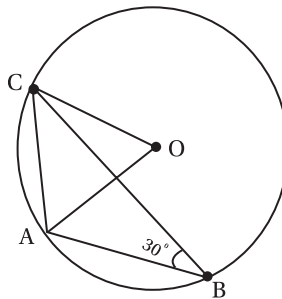
- (A) 2      (B) 3      (C)  $\sqrt{2}$       (D) 4

71. ABCD is a parallelogram and  $AB : AD = 2 : 1$  and  $DE = EC$ . Then  $\angle AEB = ?$



- (A)  $30^\circ$       (B)  $60^\circ$       (C)  $90^\circ$       (D)  $120^\circ$

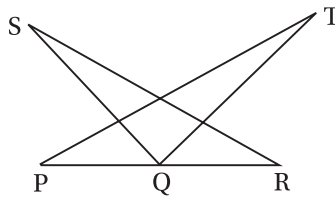
72. In the given figure, O is centre of the circle and then  $\angle CAO = ?$



- (A)  $30^\circ$       (B)  $45^\circ$       (C)  $60^\circ$       (D)  $90^\circ$

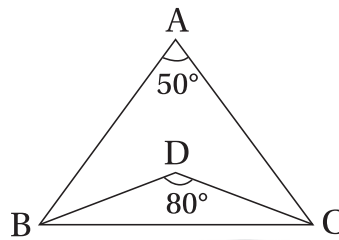


73. Which of the following option is correct if  $\angle PQS = \angle TQR$ ,  $\angle SRP = \angle TPR$  and  $PQ = QR$ ?



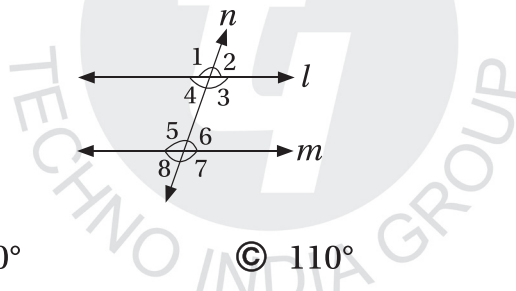
- (A)  $QS = QT$       (B)  $QS = 2QT$       (C)  $PT = 2RS$       (D)  $PT = \frac{1}{2}RS$

74. Find the value of  $\angle ABD$  if  $AB = AC$  and  $DB = DC$ .



- (A)  $20^\circ$       (B)  $45^\circ$       (C)  $30^\circ$       (D)  $15^\circ$

75. In figure,  $l \parallel m$  and  $\angle 1 = (2x + y)^\circ$ ,  $\angle 4 = (x + 2y)^\circ$ ,  $\angle 6 = (3y + 20)^\circ$ . Find  $\angle 7$ .



- (A)  $90^\circ$       (B)  $120^\circ$       (C)  $110^\circ$       (D)  $100^\circ$

**Biology**

76. Blood is a :

- (A) Fluid epithelial tissue      (B) Intracellular tissue  
(C) Plasma      (D) Fluid connective tissue

77. Which among these is not a muscle cell?

- (A) Striated      (B) Smooth      (C) Cardiac      (D) Hyaline

78. Ligament and tendon are helpful in :

- (A) Articulation of bone and attachment of muscle  
(B) Blood circulation  
(C) Nerve impulse  
(D) None of these

79. Structural and functional unit of nervous system is :

- Ⓐ Nephron                      Ⓑ Neuron                      Ⓒ Nephridia                      Ⓓ None of these

80. Nucleated part of nerve cell is called :

- Ⓐ Axon                      Ⓑ Dendrites                      Ⓒ Cyton                      Ⓓ None of the above

81. Striped muscle fibres possess :

- Ⓐ Longitudinal striations                      Ⓑ Oblique striations  
Ⓒ Transverse striations                      Ⓓ No striations

82. Impulse is brought to a nerve cell through :

- Ⓐ Dendrite                      Ⓑ Neurofibril                      Ⓒ Axon                      Ⓓ Nissl granules

### Assertion-Reason type Questions (83-84):

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

- 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.

83. **Assertion:** Cartilage is present at the ends of long bones.

**Reason:** Cartilage prevents wear and tear of the rubbing surfaces of the bones.

- Ⓐ A                      Ⓑ B                      Ⓒ C                      Ⓓ D

84. **Assertion:** Blood and lymph are fluid connective tissue.

**Reason:** Both blood and lymph do not have matrix between their cells.

- Ⓐ A                      Ⓑ B                      Ⓒ C                      Ⓓ D

### Case Based Question (85-87):

All locomotory activities and movements are brought about by muscular tissue. In our body, there are three types of muscular tissue – skeletal, smooth and cardiac. They differ from each other in the structure of their cells, function and being voluntary or involuntary.

85. Which muscular tissue is multinucleated?

- Ⓐ Skeletal                      Ⓑ Smooth                      Ⓒ Cardiac                      Ⓓ All

86. Which of the following is a characteristic of muscular tissue?

- Ⓐ The cells are ovoid                      Ⓑ The cells show Nissl granules  
Ⓒ The cells are present in the brain                      Ⓓ None

87. Which of the following is/are involuntary in nature?  
 (A) Skeletal muscles (B) Smooth muscles (C) Both (A) and (B) (D) Neither (A) nor (B)
88. Osteocytes are associated with:  
 (A) Bone (B) Cartilage (C) Ligament (D) Tendon
89. The lining of blood capillaries are made up of  
 (A) Adipose tissue (B) Squamous epithelial tissue  
 (C) Columnar epithelium (D) Ligament
90. The tissue that prevents loss of heat from the body is—  
 (A) Muscular tissue (B) Adipose tissue (C) Cartilage (D) Blood
91. Example of uni-membranous cell organelle is :  
 (A) Vacuole (B) Golgi body (C) ER (D) All of these
92. In mitosis, the resultant daughter cells are  
 (A) Haploid (B) Diploid (C) Triploid (D) Tetraploid
93. Choose the correct sequence of steps during division of nucleus—  
 (A) Prophase → Metaphase → Telophase → Anaphase  
 (B) Prophase → Telophase → Metaphase → Anaphase  
 (C) Telophase → Anaphase → Metaphase → Prophase  
 (D) Prophase → Metaphase → Anaphase → Telophase
94. Meristematic tissue is not found in  
 (A) Root apex (B) Stem apex (C) Internodes (D) Vascular bundle
95. The leaf stalks are flexible due to the presence of  
 (A) Parenchyma (B) Collenchyma  
 (C) Meristematic tissue (D) Sclerenchyma

### Assertion-Reason type Questions (96-98):

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

- 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.

96. **Assertion:** The inner lining of intestine has tall epithelial cells.

**Reason:** Columnar epithelium facilitates absorption and secretion.

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

97. **Assertion:** Surface of skin is impervious to water.

**Reason:** Surface of skin is covered by stratified cuboidal epithelium.

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

98. **Assertion:** Smooth muscle fibres are not striated.

**Reason:** There is a regular alternate arrangement of dark and light bands in the smooth muscle fibres.

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

99. Areolar tissue connects—

(A) Bone with bone

(B) Bone with muscle

(C) Fat with muscle

(D) Integument with muscle

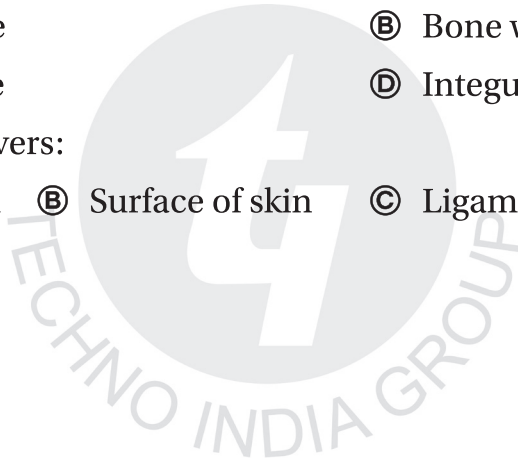
100. Myelin sheath covers:

(A) Axon of neuron

(B) Surface of skin

(C) Ligaments

(D) Arteries



## **Space For Rough Works**

## Space For Rough Works