

**PART I : PHYSICS**

This section contains **10 Single Choice Questions (Q : 01 to Q : 10)**. Each question has four choices **(A), (B), (C) and (D)** out of which **ONLY ONE** is correct.

1. A vehicle starts from rest and accelerates uniformly. After a certain interval of time, its velocity becomes 20 m/s. If the acceleration was maintained at  $2 \text{ m/s}^2$ , determine the time taken to reach this velocity.

- (A) 5 s  
 (B) 10 s  
 (C) 15 s  
 (D) 20 s

2. A car travels half the distance with constant velocity of 40 kmph and the remaining half with a constant velocity of 60 kmph. The average velocity of the car in kmph is :

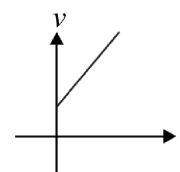
- (A) 40  
 (B) 45  
 (C) 48  
 (D) 50

3. Match **Column - I** with **Column - II** and select the correct answer using the codes given below.

**Column - I**
**Column - II**

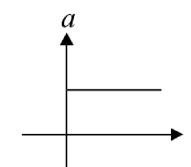
**P.** Uniform velocity

1.



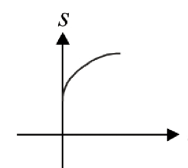
**Q.** Constant acceleration

2.



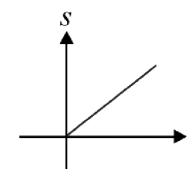
**R.** Uniform retardation

3.



**S.** Uniform acceleration

4.



**Code :**

	<b>P</b>	<b>Q</b>	<b>R</b>	<b>S</b>
(A)	1	2	4	3
(B)	4	2	3	1
(C)	2	1	3	4
(D)	1	2	3	4

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4. When a force of 20 N is applied on a body of mass 5 kg, it accelerates. If the same force is applied on a different body and it experiences only half the acceleration, what is the mass of the second body?

- (A) 2.5 kg
- (B) 10 kg
- (C) 20 kg
- (D) 40 kg

5. A person standing on a frictionless surface throws a stone of mass 0.5 kg with a velocity of 10 m/s in one direction. If the mass of the person is 70 kg, calculate the recoil velocity of the person.

- (A) 0.07 m/s
- (B) 0.5 m/s
- (C) 1.5 m/s
- (D) 10 m/s

6. **Assertion (A)** : A body continues to be in the state of rest or motion unless an external force is applied.

**Reason (R)** : Inertia of an object tends to resist a change in its state.

- (A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).
- (B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

(C) Assertion (A) is true and Reason (R) is false.

(D) Assertion (A) is false and Reason (R) is true.

**Paragraph for Questions 07 & 08**

Two masses 8 kg and 12 kg are connected at the two ends of a light in extensible string that goes over a friction less pulley.

The acceleration can be derived from the net force acting on the system, while the tension can be analyzed from the free-body diagram of the individual masses. Newton's second law is applied in both vertical and horizontal directions depending on the object.

7. Find the acceleration of the masses.

- (A) 2 m/s<sup>2</sup>
- (B) 4 m/s<sup>2</sup>
- (C) 6 m/s<sup>2</sup>
- (D) 8 m/s<sup>2</sup>

8. Find the tension in the string when the masses are released.

- (A) 100 N
- (B) 196 N
- (C) 96 N
- (D) 200 N

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9. **Assertion (A)** : If displacement of an object is zero, the distance travelled is also zero.

**Reason (R)** : Distance is always greater than or equal to displacement.

(A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

(C) Assertion (A) is true and Reason (R) is false.

(D) Assertion (A) is false and Reason (R) is true.

**Sequence Based**

10. A vehicle moves in four successive phases: it starts from rest and accelerates uniformly for 5 seconds at  $2 \text{ m/s}^2$ , then continues at the attained velocity for 10 seconds, then decelerates uniformly for 5 seconds coming to rest, and finally remains stationary for 5 seconds. What is the total distance covered by the vehicle during this time interval?

(A) 100 m

(B) 150 m

(C) 200 m

(D) 250 m

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**PART II : CHEMISTRY**

This section contains **10 Single Choice Questions (Q : 11 to Q : 20)**. Each question has four choices **(A), (B), (C) and (D)** out of which **ONLY ONE** is correct.

**11.** Following statements are given by four students – Riya, Kabir, Meera, and Yash.

**Riya :** Forces of attraction between the particles increase in the order:

Nitrogen < Water < Sugar.

**Kabir :** Boiling water is hotter than steam because of latent heat of vaporisation.

**Meera :** Liquefying a gas involves applying pressure and cooling the gas.

**Yash :** Ice at 273 K is more effective in cooling than water at 273 K.

The correct statement(s) is/are given by:

- (A) Kabir and Meera only
- (B) Riya only
- (C) Riya, Meera and Yash only
- (D) Kabir and Yash only

**12.** Which of the following is correctly matched?

- (A) Dispersed phase-Solid, Dispersion medium-Liquid, Examples-Milk, gelatin (as gel)
- (B) Dispersed phase-Liquid, Dispersion medium-Solid, Examples-Jelly, butter
- (C) Dispersed phase-Gas, Dispersion medium-Solid, Examples-whipped cream, pumice stone
- (D) Dispersed phase-Gas, Dispersion medium-Liquid, Examples-Smoke, gem stone

**13.** Match **Column – I** with **Column – II** and select the correct answer using the codes given below.

Column – I	Column – II
<b>P.</b> Particles move randomly	<b>1.</b> Water
<b>Q.</b> Layers can slide over each other	<b>2.</b> Sugar
<b>R.</b> Changes directly to gaseous state	<b>3.</b> Nitrogen
<b>S.</b> Particles are not free to move	<b>4.</b> Ammonium chloride

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**Code :**

	<b>P</b>	<b>Q</b>	<b>R</b>	<b>S</b>
(A)	1	2	3	4
(B)	4	3	2	1
(C)	3	1	4	2
(D)	2	1	4	3

**14.** A mixture is prepared by combining oil and vinegar. After shaking, it appears uniform. Which statement is logically correct?

- (A) It is homogeneous because it looks uniform.
- (B) It is heterogeneous because the components will eventually separate.
- (C) It is homogeneous as long as shaking continues.
- (D) It is a compound because it contains more than one element.

**15.** The table below shows the melting and boiling points of four substances: **P**, **Q**, **R**, and **S**.

<b>Substance</b>	<b>Melting point(°C)</b>	<b>Boiling point(°C)</b>
<b>P</b>	-80	-60
<b>Q</b>	20	200
<b>R</b>	-10	75
<b>S</b>	-180	-160

Assume room temperature = 25°C.

Choose the correct option based on the table and the following statements:

- Substance **P** will exist as a gas at room temperature.
  - Substance **Q** will be in the liquid state at room temperature.
  - Substance **R** will undergo freezing at -10°C.
  - Substance **S** will undergo boiling at -155°C.
- (A) Statements 1, 2 and 3 are correct  
 (B) Statements 2 and 4 are correct  
 (C) Only Statement 3 is incorrect  
 (D) All statements are correct

**16. Assertion (A) :** The rate of evaporation increases with increase in temperature.

**Reason (R) :** High temperature and high humidity increase the average kinetic energy of water molecules.

- (A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).
- (B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).
- (C) Assertion (A) is true and Reason (R) is false.
- (D) Assertion (A) is false and Reason (R) is true.

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**Paragraph for Questions 17 & 18**

A suspension is a heterogeneous mixture in which the solute particles do not dissolve but remain suspended through the bulk of the medium. A colloidal solution is a heterogeneous mixture, but looks like a homogeneous mixture due to the very small size of particles. Depending on the dispersed phase and dispersion medium colloidal solutions are of 8 types.

17. Which of the following is incorrect for a solution of oil and water with soap solution.
- (A) It forms an emulsion.  
(B) Soap acts as an emulsifying agent.  
(C) It is a heterogeneous mixture.  
(D) It is a suspension and not a colloid.
18. Identify the correct statement(s).
- (i) Solution of copper sulfate shows Tyndall effect.  
(ii) Tyndall effect can be observed when a fine beam of light enters a room through a small hole due to scattering of light by the particles of dust and smoke in the air.  
(iii) Tyndall effect can be observed when sunlight passes through the canopy of a dense forest.  
(iv) The mixture of water and milk shows the Tyndall effect.



- (A) Only (i)  
(B) (ii) and (iii) only  
(C) (ii), (iii) and (iv) only  
(D) All of these

19. **Assertion (A)** : Colloidal solutions are stable and the colloidal particles do not settle down.

**Reason (R)** : Brownian movement counters the force of gravity acting on colloidal particles.

- (A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).  
(B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).  
(C) Assertion (A) is true and Reason (R) is false.  
(D) Assertion (A) is false and Reason (R) is true.

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**Sequence Based**

20. Choose the correct sequence of how a pressure cooker functions.

**Step-1:** Since the volume is fixed, accumulation of steam leads to a progressive rise in internal pressure.

**Step-2:** As temperature increases, it generates steam in a restricted volume.

**Step-3:** Thermal energy is supplied to water.

**Step-4:** The elevated pressure consequently increases the boiling point of water beyond  $100^{\circ}\text{C}$ .

**Step-5:** Higher temperature inside the pressure cooker results in faster cooking.



- (A) 1 → 2 → 3 → 4 → 5  
 (B) 3 → 2 → 1 → 4 → 5  
 (C) 2 → 1 → 3 → 5 → 4  
 (D) 1 → 3 → 2 → 5 → 4

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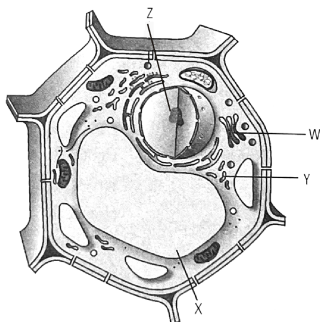
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**PART III : BIOLOGY**

This section contains **10 Single Choice Questions (Q : 21 to Q : 30)**. Each question has four choices **(A), (B), (C) and (D)** out of which **ONLY ONE** is correct.

21. Identify W,X,Y and Z.



- (A) W-Golgi apparatus, X-Tonoplast, Y-Lysosomes, Z-Plastid
- (B) W-Dictyosome, X-Vacuole, Y-Ribosome, Z-Nucleolus
- (C) W-Dictyosome, X-Nucleus Y-Lysosomes, Z-Ribosome
- (D) W-Endoplasmic reticulum, X-Nucleus, Y-Lysosomes, Z-Ribosome

22. Which of the following statements is not correct for the vacuoles?

- (A) Contractile vacuoles are helpful in excretion.
- (B) Food vacuoles are formed by engulfing the food particles.
- (C) Sap vacuoles are bound by a single membrane.
- (D) Tonoplast facilitates the transport of ions against the concentration gradient into the cytoplasm.

23. Match **Column - I** with **Column - II** and select the correct answer using the codes given below.

Column - I	Column - II
<b>P.</b> Metacentric	<b>1.</b> At the tip
<b>Q.</b> Acrocentric	<b>2.</b> Slightly away from the middle
<b>R.</b> Telocentric	<b>3.</b> At the middle
<b>S.</b> Submetacentric	<b>4.</b> Almost near the tip

**Code :**

	<b>P</b>	<b>Q</b>	<b>R</b>	<b>S</b>
(A)	1	2	3	4
(B)	4	3	2	1
(C)	3	4	1	2
(D)	2	1	4	3

24. Choose the **INCORRECT** statement:

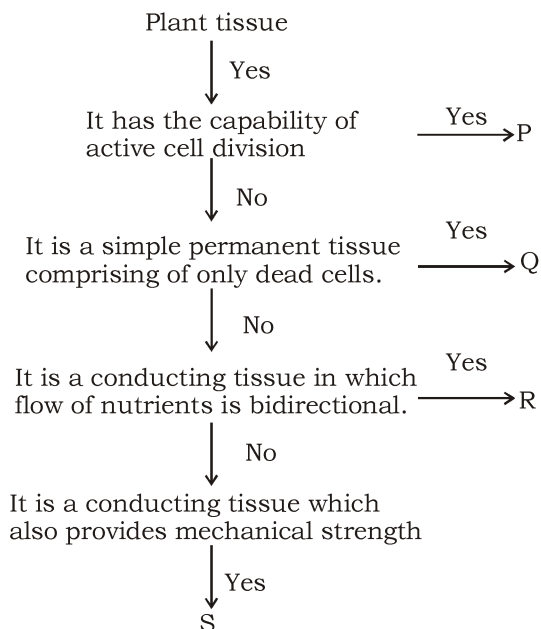
- (A) The nature of the matrix differs according to the function of the tissue.
- (B) Fats are stored below the skin and in between the internal organs.
- (C) Epithelial tissues have intercellular spaces between them.
- (D) Cells of striated muscles are multinucleated and unbranched.

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25. Study the given flow chart and select the incorrect statement regarding P, Q, R and S.



- (A) P can be the tissue which is present in root tips and shoot tips.
- (B) Tissue Q is primarily responsible for storage of food.
- (C) Tissue R is responsible for transport of food from leaves to other parts of the plant body.
- (D) Tissue S is made up of four types of cells - vessels, tracheids, fibres, and parenchyma.

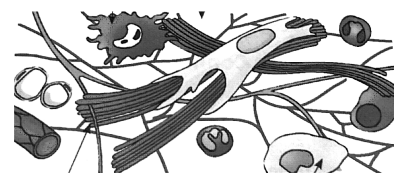
26. **Assertion (A)** : Parenchyma is the most abundant and versatile plant tissue.

**Reason (R)** : Parenchyma cells are living and can perform functions like photosynthesis, storage, and healing.

- (A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).
- (B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).
- (C) Assertion (A) is true and Reason (R) is false.
- (D) Assertion (A) is false and Reason (R) is true.

**Paragraph for Questions 27 & 28**

Connective tissues connect, bind, and support other tissues. Areolar tissue is found between skin and muscles and provides flexibility and cushioning. Adipose tissue stores fat and is primarily located beneath the skin, acting as an insulator and energy reserve. Both tissues contain fibroblasts, collagen fibers, and a matrix but differ significantly in function and appearance.



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27. Areolar connective tissue mainly contributes to:

- (A) Hormonal secretion
- (B) Flexibility and repair of tissues
- (C) Rigid structure to the body
- (D) Blood production

28. The extracellular matrix in connective tissues is primarily composed of:

- (A) Protein only
- (B) Fat and glucose
- (C) Cells and nuclei
- (D) Fibers and ground substance

29. **Assertion (A)** : Nucleus is absent in prokaryotic cells.

**Reason (R)** : Prokaryotic cells have a well-defined nuclear membrane and nucleolus.

- (A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).
- (B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).
- (C) Assertion (A) is true and Reason (R) is false.
- (D) Assertion (A) is false and Reason (R) is true.

### Sequence Based

30. Which of the following sequences shows the correct order of events in the Golgi-mediated packaging process?

- (A) Vesicle formation → Protein folding → Packaging in Golgi → Exocytosis
- (B) Protein synthesis → Golgi modification → Transport
- (C) Protein folding → DNA transcription → Ribosome activation → Vesicle transport
- (D) DNA replication → ER folding → Exocytosis → Golgi sorting

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**PART IV : MATHEMATICS**

This section contains **20 Single Choice Questions (Q : 31 to Q : 50)**. Each question has four choices **(A), (B), (C) and (D)** out of which **ONLY ONE** is correct.

**31.** Find the values of a and b if

$$\frac{\sqrt{3}+1}{\sqrt{3}-1} - \frac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}.$$

- (A)  $a = 0, b = \frac{-1}{2}$
- (B)  $a = \frac{1}{2}, b = 0$
- (C)  $a = 0, b = 2$
- (D)  $a = 2, b = -1$

**Sequence Based**

**32. Problem:** Find the values of p, q, and r based on the following constraints:

1.  $p + q + r = 6$
  2.  $2p - q + 3r = 9$
  3.  $3p + 2q - r = 4$
- P.** Use the values of p and r in the simplest original equation to find the value of q.
- Q.** Create a new  $2 \times 2$  system by eliminating one variable, such as q, from two different pairs of equations.
- R.** Solve the resulting  $2 \times 2$  system to find the values for the other two variables, p and r.
- S.** Assemble the final solution for the ordered triple (p, q, r).

Which list shows the steps in the correct order?

- (A) Q, R, P, S
- (B) P, Q, R, S
- (C) Q, P, R, S
- (D) P, Q, S, R

**33.** If the distance between the points (x, 0) and (0, -2) is 3 units, then the value of x is :

- (A)  $\sqrt{5}$
- (B)  $-\sqrt{5}$
- (C)  $\pm\sqrt{5}$
- (D)  $\pm 5$

**34. Assertion (A) :** If  $x = 2^{1/3} - 2^{-1/3}$ , then the value of  $2x^3 + 6x$  is 3.

**Reason (R) :** The formula for the cube of a binomial is  $(a - b)^3 = a^3 - b^3 - 3ab(a - b)$ .

- (A) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).
- (B) Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).
- (C) Assertion (A) is true and Reason (R) is false.
- (D) Assertion (A) is false and Reason (R) is true.

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35. The expression  $(a + b + c)^2 + (a + b - c)^2 + (a - b + c)^2 + (b + c - a)^2$  equal to \_\_\_\_\_.

- (A)  $2(a^2 + b^2 + c^2 + ab + bc + ac)$
- (B)  $4(a^2 + b^2 + c^2)$
- (C)  $(a^2 + b^2 + c^2)$
- (D)  $4(ab + ac + bc)$

36. Which of the following statement/s is/ are **True(T)** or **False(F)** ?

- (i) A point  $P(x, y)$  lies on the  $y$ -axis if and only if its abscissa is zero.
- (ii) If the coordinates of a point  $P(x, y)$  satisfy the condition  $xy < 0$ , then  $P$  must lie in the second or fourth quadrant.
- (iii) The perpendicular distance of a point  $P(a, b)$  from the  $x$ -axis is  $|a|$ .
- (iv) The abscissa of a point is its directed distance from the  $x$ -axis.

**Code :**

- |     | (i) | (ii) | (iii) | (iv) |
|-----|-----|------|-------|------|
| (A) | T   | T    | F     | F    |
| (B) | T   | F    | T     | T    |
| (C) | T   | T    | F     | T    |
| (D) | F   | T    | T     | F    |

37. The number of ways of writing the number  $\frac{1}{15}$  in the form  $\frac{a}{3} - \frac{b}{5}$ , (where

$a, b$  are real numbers and  $a, b \neq 0$ ) is :

- (A) 1
- (B) 0
- (C) Finite solution
- (D) Infinitely many solutions

**Paragraph for Questions 38 & 39**

A landscape architect is designing a rectangular garden. The length of the garden is given by the expression  $(\sqrt{75} + \sqrt{48})$  meters and the breadth is given by  $(\sqrt{75} - \sqrt{48})$  meters. The architect plans to cover the entire garden with a special type of grass that costs Rs.150 per square meter.

38. What is the total area of the garden in square meters?

- (A) 27
- (B) 3
- (C)  $9\sqrt{3}$
- (D)  $12\sqrt{3}$

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**39.** Based on the area calculated, what will be the total cost to cover the garden with the special grass?

- (A) Rs. 4050
- (B) Rs. 450
- (C) Rs.  $1350\sqrt{3}$
- (D) Rs.  $1800\sqrt{3}$

**40.** Match **Column - I** with **Column - II** and select the correct answer using the codes given below.

Column - I	Column - II
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**P.** In a right-angled **1.** XY

$\Delta ABC$  with  
 $\angle B = 90^\circ$ , the  
 longest side is :

**Q.** In  $\Delta ABC$  with **2.** YZ

$\angle A = 70^\circ$  and  
 $\angle C = 50^\circ$ , the  
 shortest  
 side is :

**R.** In  $\Delta XYZ$  with **3.** AC

side  $YZ = 4$ ,  
 $XY = 6$ ,  $ZX = 5$ ,  
 the side  
 opposite the  
 greatest  
 angle is :

**S.** In isosceles **4.** AB

$\Delta XYZ$  with  
 $XY = XZ$  and  
 $\angle Y = 70^\circ$ , the  
 shortest side is :

**Code :**

- |     | <b>P</b> | <b>Q</b> | <b>R</b> | <b>S</b> |
|-----|----------|----------|----------|----------|
| (A) | 4        | 1        | 3        | 2        |
| (B) | 3        | 4        | 1        | 2        |
| (C) | 3        | 1        | 4        | 2        |
| (D) | 2        | 1        | 4        | 3        |

**41.** The distance between the points  $P(6, 6)$  and  $Q(2, -2)$  is calculated as :

- (A)  $6\sqrt{5}$
- (B)  $7\sqrt{5}$
- (C)  $4\sqrt{5}$
- (D)  $3\sqrt{5}$

**Sequence Based**

**42. Problem :** If  $a$  and  $b$  are rational numbers, find their values when :

$$\frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} - \sqrt{3}} = a + b\sqrt{5}$$

Which list shows the steps in the correct order?

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**P.** Now, compare both sides of the equation  $4 + \sqrt{15} = a + b\sqrt{15}$ .

By equating the rational and irrational parts, we get the final answer :  $a = 4$  and  $b = 1$ .

**Q.** The expression simplifies to  $\left(\frac{8+2\sqrt{15}}{2}\right)$ . By separating this into

two fractions, we get  $\frac{8}{2} + \frac{(2\sqrt{15})}{2}$ , which results in  $4 + \sqrt{15}$ .

**R.** To get rid of the surd in the denominator, multiply the numerator and the denominator by the conjugate of the denominator, which is

$$(\sqrt{5} + \sqrt{3}) = \frac{(\sqrt{5} + \sqrt{3})}{(\sqrt{5} - \sqrt{3})} \times \frac{(\sqrt{5} + \sqrt{3})}{(\sqrt{5} + \sqrt{3})}$$

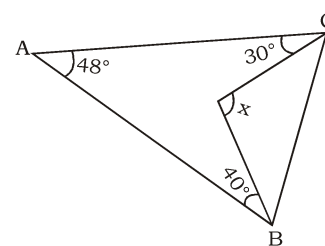
**S.** Expand the numerator :

$$\text{Numerator : } (\sqrt{5})^2 + 2(\sqrt{5})(\sqrt{3}) + (\sqrt{3})^2 = 5 + 2\sqrt{15} + 3 = 8 + 2\sqrt{15}.$$

$$\text{Denominator : } (\sqrt{5})^2 - (\sqrt{3})^2 = 5 - 3 = 2.$$

- (A) P, R, Q, S
- (B) S, Q, R, P
- (C) R, Q, S, P
- (D) R, S, Q, P

**43.** The value of  $x$  in the given figure is :



- (A)  $72^\circ$
- (B)  $118^\circ$
- (C)  $20^\circ$
- (D)  $223^\circ$

**44. Assertion (A) :** It is possible to construct a triangle with side lengths 4 cm, 5 cm, and 10 cm.

**Reason (R) :** The sum of the lengths of any two sides of a triangle must be greater than the length of the third side.

- (A) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).
- (B) Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).
- (C) Assertion (A) is true and Reason (R) is false.
- (D) Assertion (A) is false and Reason (R) is true.

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45.  $\Delta PQR$  is right angled triangle at Q,  $PR = 5$  cm and  $QR = 4$ cm. If the lengths of sides of another  $\Delta ABC$  are 3 cm, 4 cm and 5 cm, then which one of the following is correct ?

- (A) Area of  $\Delta PQR$  is double that of  $\Delta ABC$
- (B) Area of  $\Delta ABC$  is double that of  $\Delta PQR$
- (C)  $\angle B = \frac{\angle Q}{2}$
- (D) Both triangles are congruent

46. Which of the following statement/s is/ are **True(T)** or **False(F)** ?

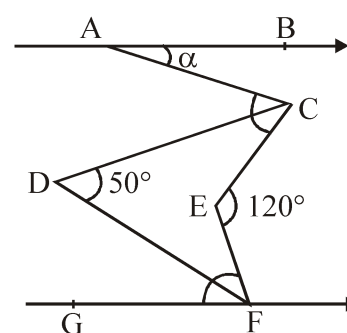
- (i) The equation  $y = mx + c$  represents a family of lines passing through the origin if  $c = 0$ .
- (ii) For any linear equation  $ax + by + c = 0$ , if  $a, b, c$  are non-zero, the line cannot pass through the origin.
- (iii) The graph of  $x + y = 0$  passes through all four quadrants.
- (iv) If  $(x_1, y_1)$  is a solution to  $L_1$  and  $(x_2, y_2)$  is a solution to  $L_2$ , then  $(x_1 + x_2, y_1 + y_2)$  is always a solution to the system  $L_1$  and  $L_2$ .

**Code :**

**(i) (ii) (iii) (iv)**

- (A) T T F F
- (B) T F T T
- (C) T T F T
- (D) F T T F

47.  $AB \parallel FG$ ,  $CD$  and  $FD$  are angle bisector as shown in figure. Find  $\angle BAC$



- (A)  $20^\circ$
- (B)  $25^\circ$
- (C)  $30^\circ$
- (D)  $35^\circ$

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*Space for rough work*

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**Paragraph for Questions 48 & 49**

A surveyor is tasked with measuring the distance between two points, A and B, on opposite sides of a building. To do this, she finds a third point C on the ground from which both A and B are visible. She measures the distance AC to be 40 meters. She then extends the line AC to a point E such that C is the midpoint of AE. Similarly, she extends the line BC to a point D such that C is the midpoint of BD. The distance between points D and E is measured to be 65 meters.

- 48.** By which rule of congruence can the surveyor prove that  $\triangle ABC$  is congruent to  $\triangle EDC$ ?
- (A) SSS (Side-Side-Side)  
 (B) ASA (Angle-Side-Angle)  
 (C) AAS (Angle-Angle-Side)  
 (D) SAS (Side-Angle-Side)
- 49.** Using the established congruence, what is the distance between the two original points, A and B?
- (A) 40 meters  
 (B) 52.5 meters  
 (C) 65 meters  
 (D) 80 meters

- 50.** Match **Column - I** with **Column - II** and select the correct answer using the codes given below.

Column - I	Column - II
------------	-------------

- |   |  |
|---|--|
| <p><b>P.</b> If <math>x + \frac{1}{x} = 3</math>,<br/>the value of<br/><math>x^3 + \frac{1}{x^3}</math> is :</p>                                | <p><b>1.</b> 0</p>                         |
| <p><b>Q.</b> If <math>a + b + c = 0</math>,<br/>then the value<br/>of <math>(a^3+b^3+c^3-3abc)</math><br/><math>(b + c) (c + a)</math> is :</p> | <p><b>2.</b> <math>2 - \sqrt{3}</math></p> |
| <p><b>R.</b> The remainder<br/>when <math>x^{51} - 1</math><br/>is divided by<br/><math>(x + 1)</math> is :</p>                                 | <p><b>3.</b> 18</p>                        |
| <p><b>S.</b> The simplified<br/>value of <math>\frac{1}{2 + \sqrt{3}}</math><br/>is :</p>   | <p><b>4.</b> -2</p>                        |

**Code :**

- |     | <b>P</b> | <b>Q</b> | <b>R</b> | <b>S</b> |
|-----|----------|----------|----------|----------|
| (A) | 1        | 2        | 3        | 4        |
| (B) | 4        | 3        | 2        | 1        |
| (C) | 3        | 1        | 4        | 2        |
| (D) | 2        | 1        | 4        | 3        |

*Space for rough work*

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**PART V : LOGICAL REASONING & IQ**

This section contains **10 Single Choice Questions (Q : 51 to Q : 60)**. Each question has four choices **(A), (B), (C) and (D)** out of which **ONLY ONE** is correct.

**51.** Which of the following numbers will replace the question mark (?) in the given series?

12, 13, 30, 99, 412, ?

- (A) 2065
- (B) 2075
- (C) 2085
- (D) 2055

**52.** Which of the following number will replace the question mark (?) in the given series ?

6, 16, 36, 76, ?, 316

- (A) 152
- (B) 146
- (C) 156
- (D) 168

**53.** Aman drives 5 km from point A towards the South. He then takes a left turn and drives 5 km. He then takes a right turn and drives 5 km. He again takes a right turn and drives 10 km. He finally takes a right turn and drives 10 km to reach point B. How much and in which direction does he have to drive to return to point A ?

- (A) 5 km towards the West
- (B) 5 km towards the North
- (C) 5 km towards the East
- (D) 5 km towards the South

**54.** P is to the North of Q. T is the East of Q and S is to the East of P. S is to the North-East of T and South-West of R. O is to the West of S. What is the position of R with respect to Q ?

- (A) North-East
- (B) South-West
- (C) East
- (D) South

**55.** B, C, E, F and H have different heights. B is taller than C but shorter than H. H is taller than E but shorter than F. E is taller than C but shorter than B. How many people are shorter than B ?

- (A) Two
- (B) Four
- (C) One
- (D) Three

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*Space for rough work*

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**56.** All 72 students of a class are standing in a row facing the North. Sahil is standing at the extreme left end of the row. Only 8 student are stadning between Sahil and Kimaya. Virat is 26<sup>th</sup> from the exterme right end of the row. How many students are standing between Virat and Kimaya ?

- (A) 37
- (B) 36
- (C) 35
- (D) 38

**57.** Which two numbers should be interchanging to make the equation correct ?

$$10 - 26 + 12 \times 20 \div 5 = 18$$

- (A) 18 and 10
- (B) 10 and 20
- (C) 12 and 26
- (D) 10 and 5

**58.** In the following question, the statement is followed by two conclusions. Which of the following conclusion(s) is/are definitely true ?

**Statement :**  $M < L > I < J > H = G > F$

**Conclusions : (I)**  $H = F$

**(II)**  $J > G$

- (A) Neither conclusion I nor II is true
- (B) Only Conclusion I is true
- (C) Both Conclusions I and II are true.
- (D) Only Conclusions II is true.

**59.** A question is given, followed by three statements labelled I, II and III. Identify which of the statement(s) is/ are sufficient to answer the question.

**Question :** How is P related to C ?

**Statements :**

**I.** H is the only brother of S and P.

**II.** P is the wife of L who is the son-in-law of D.

**III.** D is the mother of S and T is the son-in-law of C.

- (A) Data in statements I, II and III together are not sufficient to answer the question.
- (B) Data in statements II and III together are sufficient to answer the question
- (C) Data in statements I,II and III together are sufficient to answer the question.
- (D) Data in statement I alone is sufficient to answer the question.

**60.** Seven boxes R, S, T, U, X, Y and Z are kept one over the other but not necessarily in the same order. Only T is kept above X. Only Z is kept between X and Y. Only U is kept below R. How many boxes are kept between S and U ?

- (A) Four
- (B) Three
- (C) One
- (D) Two

*Space for rough work*

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