


## QUESTIONS

## TEST INSTRUCTIONS

**Welcome to Indore Institute of Science and Technology(IIST)****Instructions for JEE Mock Test**

1. **Total Questions: 75**
  - **Physics:** 25 Questions
  - **Chemistry:** 25 Questions
  - **Mathematics:** 25 Questions
2. **Question Format:**
  - Each section contains **20 MCQs (Multiple Choice Questions)**
  - Each section contains **5 NAT (Numerical Answer Type) questions**
3. **Marking Scheme:**
  - **Correct Answer:** +4 marks
  - **Incorrect Answer (MCQs & NAT):** -1 mark (negative marking)
  - **Unattempted Question:** 0 marks
4. **Test Duration:** 3 Hours (180 minutes)
5. **Calculator Usage:**
  - You are allowed to use the **on-screen scientific calculator** provided in the test interface.
  - **Switching screens is not allowed**—doing so will result in **auto-submission of the test**.
6. **Instructions for Answering:**
  - Read each question carefully before answering.
  - For MCQs, select the correct option from the given choices.
  - For NAT questions, enter the numerical answer as per the given instructions.
  - Be mindful of negative marking for incorrect answers.
7. **General Guidelines:**
  - Use only the on-screen calculator for calculations.
  - Do not navigate away from the test screen; otherwise, your test will be **auto-submitted**.
  - Manage your time effectively to attempt all questions.

Best of luck! 

SECTIONS

1. Physics - 25 Questions
2. Chemistry - 25 Questions
3. Maths - 25 Questions

Section 1 : Physics - 25 Questions

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1 Rahul throws the ball upward with 30 m/s the wind imparts a horizontal acceleration of 5 m/s<sup>2</sup> to the left. The angle  $\theta$  with the vertical at which the ball must be thrown so that the ball returns to Rahul's hand is: ( $g = 10 \text{ m/s}^2$ )

☐  $\tan^{-1}(0.5)$

☐  $\tan^{-1}(0.4)$

☐  $\tan^{-1}(0.2)$

☐  $\tan^{-1}(0.3)$

Correct: +4 · Incorrect: -1

2 Position coordinate of a particle moving in a 3-D coordinate system is given by:

$$x = a \sin \alpha t$$

$$y = a \cos \alpha t$$

$$z = 3a \alpha t$$

The speed of the particle is  $(\sqrt{n}) a \alpha$ . The value of n is:

☐ 10

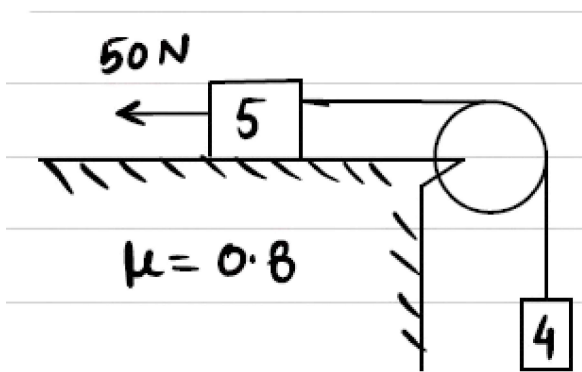
☐ 5

☐ 2

☐ 1

Correct: +4 · Incorrect: -1

3 What will be the acceleration of blocks and magnitude and direction of friction force between block A and table?



☐ Zero,  $-10\hat{i}\text{ N}$

☐ Zero,  $10\hat{i}\text{ N}$

☐  $40/9\text{ m/s}^2$ ,  $-10\hat{i}\text{ N}$

☐  $40/9\text{ m/s}^2$ ,  $10\hat{i}\text{ N}$

Correct: +4 · Incorrect: -1

4 A stone is thrown horizontally from a tower with speed  $10\text{ m/s}$ . Find the radius of curvature of its trajectory at the end of  $3\text{ sec}$  after the motion has begun is  $10 \times n \sqrt{n}\text{ m}$  (Take  $g = 10\text{ m/s}^2$ ). The value of  $n$  is:

- ☐ 5
- ☐ 10
- ☐ 2
- ☐ 4

Correct: +4 · Incorrect: -1

- 5 A block of mass  $m$  is kept on a rough horizontal turn table at a distance  $r$  from the centre of table. The coefficient of friction between the turntable and block is  $\mu$ . Now turntable starts rotating with uniform angular acceleration  $\alpha$ . The time after which slipping occurs between block and turntable is given by:

$$t = (\mu^2 g^2 - \alpha^2 r^2)^n / (\alpha^4 r^2)$$

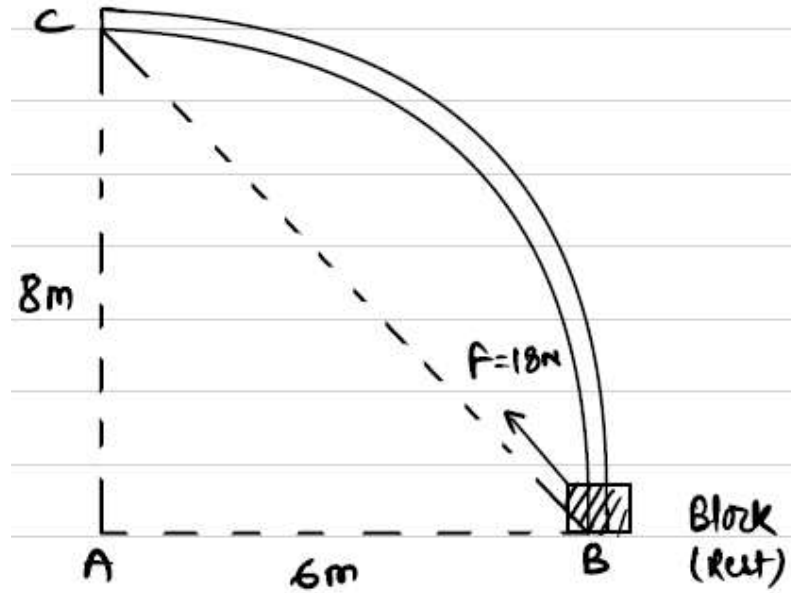
The value of  $n$  is:

- ☐ 4
- ☐ 1/4
- ☐ 2
- ☐ 1/2

Correct: +4 · Incorrect: -1

- 6 Consider an elliptically shaped rail between B & C in the vertical plane with  $AB = 6\text{m}$  &  $AC = 8\text{m}$ . A block of mass  $1\text{ kg}$  is pulled along the rail from B to C with a force of  $18\text{N}$ , which is

always parallel to PQ. Assuming no frictional losses, the kinetic energy of the block when it



reaches Q is  $n \times 5\text{ J}$ . Find  $n$ .

- ☐ 10
- ☐ 15
- ☐ 20
- ☐ 25

Correct: +4 · Incorrect: -1

7 A body of mass  $0.2\text{ kg}$  has an initial velocity  $6\hat{i}\text{ m/s}$ . It collides elastically with another identical body B which has initial velocity  $10\hat{j}\text{ m/s}$ . After the collision, Body B moves with  $6(\hat{i} + \hat{j})\text{ m/s}$ . The kinetic energy of Body A after the collision will be  $x/10\text{ J}$ . Find the value of  $x$ .

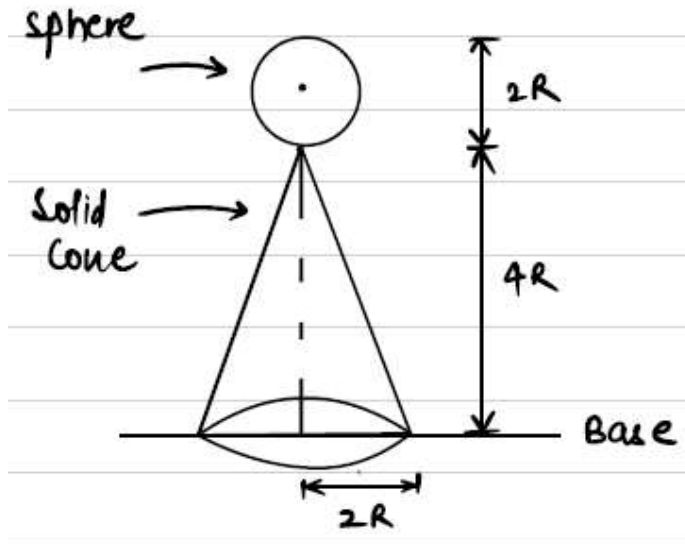
- ☐ 32
- ☐ 64

☐ 16

☐ 128

Correct: +4 · Incorrect: -1

- 8 Find the position of COM(Center of Mass) from the base of the cone. The density of the material of the sphere is 12 times that of the cone.



☐ 3.5 R

☐ 3 R

☐ 4.5 R

☐ 4 R

Correct: +4 · Incorrect: -1

- 9 Two rods of equal masses and length  $L$  lie along the  $x$ -axis and  $y$ -axis with their centers at the origin. The moment of inertia of the system about the line  $x = y$  is  $mL^2/k$ . Find the value of  $k$ .

☐ 6

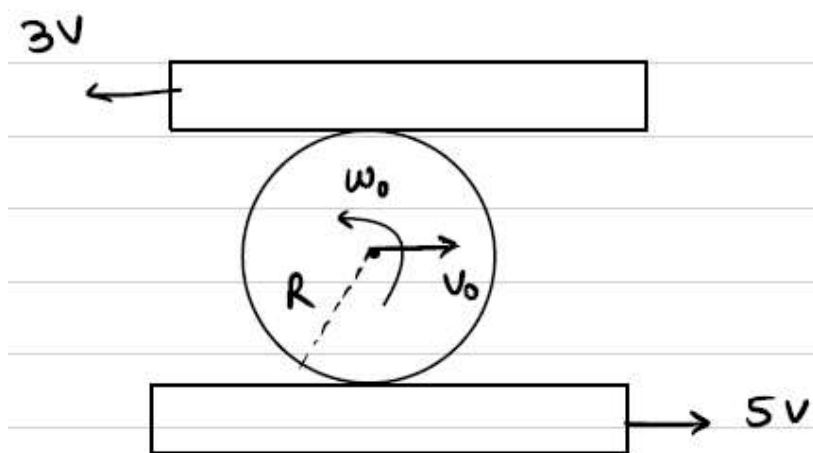
☐ 3

☐ 12

☐ 4

Correct: +4 · Incorrect: -1

10 Find  $\omega_0$  and  $v_0$  if no slipping occurs anywhere.



☐  $\omega_0 = 4V/R, v_0 = 2V$

☐  $\omega_0 = 4V/R, v_0 = V$

☐  $\omega_0 = 2V/R, v_0 = 2V$

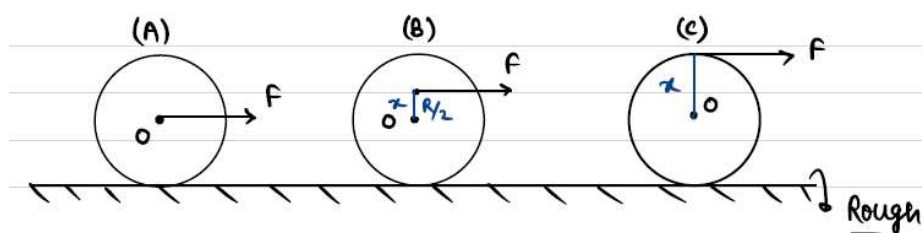
☐  $\omega_0 = 2V/R, v_0 = 2V$

Correct: +4 · Incorrect: -1

- 11 Two mechanical waves  $y_1 = 2\sin(2\pi(50t - 2x))$  and  $y_2 = 4\sin(2\pi(ax + 100t))$  propagate in a medium with the same speed.
- I) The ratio of their intensities is 1:12.
- II) The value of  $a$  is 4 units.
- III) The value of  $a$  is 8 units.
- IV) The ratio of their intensities is 1:4.
- ☐ All are correct.
- ☐ Only I and II are correct.
- ☐ Only II and IV are correct.
- ☐ None is correct.

Correct: +4 · Incorrect: -1

- 12 Three discs A, B, and C are placed on rough ground and acted upon by an equal force  $F$ . All discs have mass  $m$  and radius  $R$ .



- I) Friction force on A is in the forward direction.
- II) Friction force on B is in the backward direction.
- III) Friction force on C is in the forward direction.
- IV) Friction force on B is zero.

Choose the correct statement.



- ☐ Only I and IV are correct.
- ☐ Only II and III are correct.
- ☐ Only I and II are correct.
- ☐ Only III and IV are correct.

Correct: +4 · Incorrect: -1

- 13 A solid sphere of radius  $R$  and density  $\delta$  is attached to one end of a spring with constant  $k$ . The other end of the spring is connected to another sphere of radius  $R$  and density  $3\delta$ . The whole system is submerged in liquid of density  $2\delta$  and is in equilibrium. If the elongation in the spring is  $N\pi R^3 \delta g / M$ , find  $N \times M$ .

- ☐ 6
- ☐ 12
- ☐ 18
- ☐ 24

Correct: +4 · Incorrect: -1

- 14 A body takes  $T_1$  time to cool from  $70^\circ\text{C}$  to  $60^\circ\text{C}$ ,  $T_2$  time from  $60^\circ\text{C}$  to  $50^\circ\text{C}$ , and  $T_3$  from  $50^\circ\text{C}$  to  $40^\circ\text{C}$ . Temperature of surroundings is  $25^\circ\text{C}$  (Newton's law of cooling is valid). Choose the correct option.

- ☐  $T_1 = T_2 = T_3$
- ☐  $T_1 > T_2 > T_3$

☐  $T_3 > T_2 > T_1$

☐ Cannot say

Correct: +4 · Incorrect: -1

15 An infinite number of electric charges each equal to  $2\mu\text{C}$  (magnitude) are placed along the x-axis at  $x = 1\text{m}$ ,  $x = 2\text{m}$ ,  $x = 4\text{m}$ ,  $x = 8\text{m}$ , and so on. If the consecutive charges have opposite signs, calculate the electric field at  $x = 0$ .

☐  $5 \times 10^6 \text{ N/C}$

☐  $18/5 \times 10^6 \text{ N/C}$

☐  $72/5 \times 10^7 \text{ N/C}$

☐  $36/5 \times 10^7 \text{ N/C}$

Correct: +4 · Incorrect: -1

16 A Length of uniform wire of resistance  $20\Omega$  is bent into a circle and two points at a quarter of the circumference apart are connected to a  $12\text{V}$  battery with an internal resistance of  $0.25\Omega$ . Find the net current supplied by the battery.

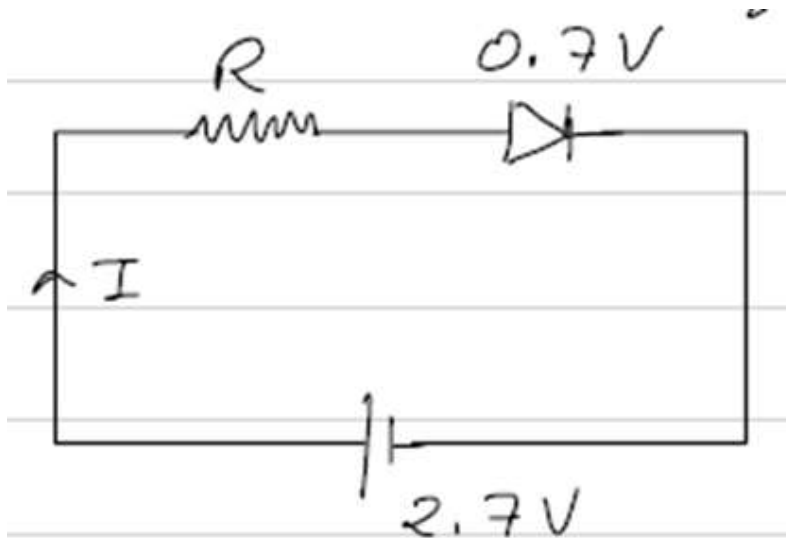
☐  $1\text{A}$

☐  $2\text{A}$

☐  $3\text{A}$

☐  $4\text{A}$

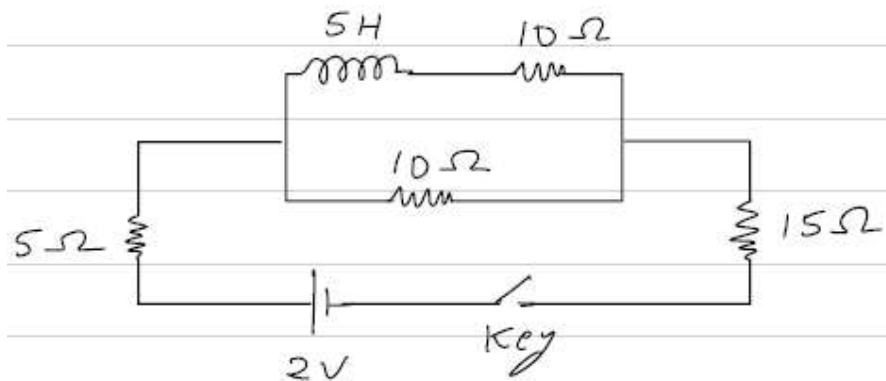
- 17 The diode used in the given circuit has a constant voltage drop of  $0.7\text{V}$  at all currents with a maximum power rating of  $200\text{mW}$ . Find the value of resistance  $R$  connected in series with the diode for obtaining maximum current?



- ☐  $20\ \Omega$   
☐  $2\ \Omega$   
☐  $30\ \Omega$   
☐  $3\ \Omega$

Correct: +4 · Incorrect: -1

- 18 In the given circuit,



if the key is closed at  $t=0$ , find the initial and final currents through the battery.

- ☐ 2/15 A, 2/25 A
- ☐ 1/15 A, 1/25 A
- ☐ 1/15 A, 2/25 A
- ☐ 2/15 A, 1/25 A

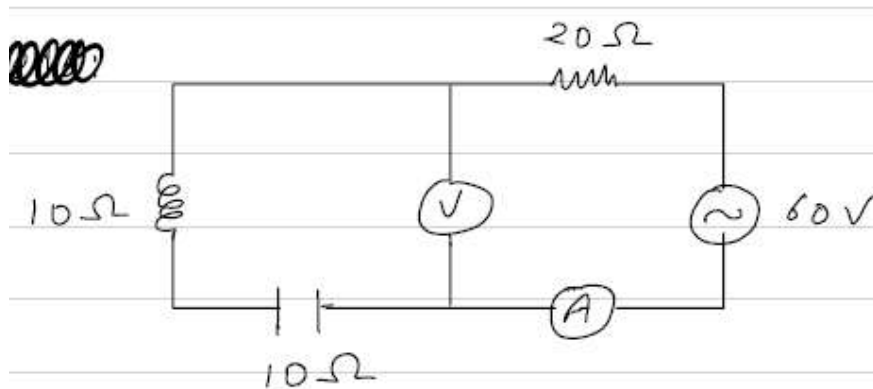
Correct: +4 · Incorrect: -1

19 Which of the following options are correct for a series RLC circuit?

- (a) Current through R and C are in the same phase.
- (b) Voltage across R and C are differ by  $\pi/2$ .
- (c) Voltage across R and L are differ by  $\pi/2$ .
- (d) Voltage across L and current through R is  $\pi$ .
- (e) Voltage across L and C differ by  $\pi/2$ .

- ☐ a, b, d
- ☐ a, b, c, d
- ☐ a, b, c
- ☐ b, c, e

Correct: +4 · Incorrect: -1



20 What will be the reading of the voltmeter and ammeter in the given circuit?

- ☐ 3 Volt, 0A
- ☐ 3 Volt, 3A
- ☐ 0 Volt, 0A
- ☐ 0 Volt, 3A

Correct: +4 · Incorrect: -1

21 A capacitor stores  $50 \mu\text{C}$  charge when connected across a battery. When the gap between the plates is filled with a dielectric, a charge of  $150 \mu\text{C}$  flows through the batter. The dielectric constant of material inserted is

Correct: +4 · Incorrect: -1

22 The objective of a telescope, after focusing for infinity, is taken out and a slit of length  $L$  is placed in its position. A sharp image of the slit is formed by the eyepiece at a certain distance from it on the other side. The length of this image is  $l$ . Then magnification of the telescope is  $L/xl$

Find 'x'?

Correct: +4 · Incorrect: -1

- 23 A small fish, 0.4m below the surface of a lake is viewed through a simple converging lens of focal length 3m. The lens is kept at 0.2m above the water surface such that the fish lies on the optical axis of the lens. The image of the fish seen by the observer in m is: (Refractive index of the water is  $\frac{4}{3}$ )

Correct: +4 · Incorrect: -1

- 24 Assuming that de-Broglie wave associated with an electron can form a standing wave between atoms arranged in one-dimensional array with nodes on each atomic site. It is found that one such standing wave is formed. The distance between the atoms of the array is  $2 \text{ \AA}$ . A similar standing wave is again formed if  $d$  is increased to  $2.5 \text{ \AA}$  but not for any other intermediate value of  $d$ , then least value of  $d$  for forming standing wave is:

Correct: +4 · Incorrect: -1

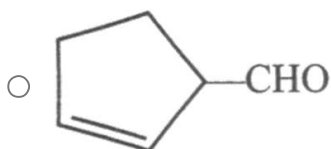
- 25 White light reflected at normal incidence from a soap film has maximum at  $6000 \text{ \AA}$  and minimum at  $4500 \text{ \AA}$  in the visible region with no minimum in between. If  $\mu$  is 1.33 for film, the thickness found to be  $X \cdot 10^{-5} \text{ cm}$ . The Value of  $X$  is :

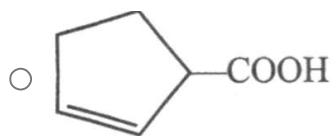
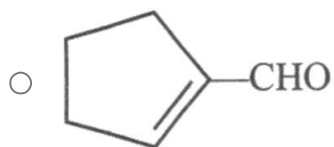
Correct: +4 · Incorrect: -1

#### Section 2 : Chemistry - 25 Questions

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- 26 Cyclohexene on ozonolysis followed by reaction with zinc dust and water gives compound E. Compound E on further treatment with aqueous KOH yields compound F. Compound F is





Correct: +4 · Incorrect: -1

27 If the radius of first orbit of hydrogen atom is  $a_0$ , which of the following can not be the radius of any other orbits of hydrogen?

☐  $4a_0$

☐  $6a_0$

☐  $9a_0$

☐  $16a_0$

Correct: +4 · Incorrect: -1

28 2.0 molal NaOH solution has a density of 1.12 gm/mol, the molarity of the solution

☐ 3.97 M

☐ 3M

☐ 3.05 M

☐ 2.07 M

Correct: +4 · Incorrect: -1

29 Calculate the minimum and maximum number of electrons which may have spin quantum number  $s = -1/2$  in Chromium (Cr)

☐ 0,1

☐ 6,12

☐ 9,15

☐ 5,9

Correct: +4 · Incorrect: -1

30 The in correct order of bond angle

☐  $\text{CO}_2 > \text{CO}_3^{2-} > \text{CF}_2\text{Cl}_2$

☐  $\text{NO}_2 > \text{NO}_3^+ > \text{NO}_2^-$

☐  $\text{XeF}_2 > \text{XeF}_4 > \text{XeCl}_4$

☐  $\text{PH}_3 > \text{AsH}_3 > \text{SbH}_3$

Correct: +4 · Incorrect: -1

31 In the reaction :





the reactant X cannot be

- ☐  $\text{CH}_3\text{NH}_2$
- ☐  $\text{NH}_3$
- ☐  $(\text{CH}_3)_2\text{NH}$
- ☐  $(\text{CH}_3)_3\text{N}$

Correct: +4 · Incorrect: -1

32 Amongst  $\text{H}_2\text{O}$ ,  $\text{H}_2\text{S}$ ,  $\text{H}_2\text{Se}$  and  $\text{H}_2\text{Te}$ , the one with the highest boiling point is

- ☐  $\text{H}_2\text{Se}$  because of lower molecular weight
- ☐  $\text{H}_2\text{S}$  because of hydrogen bonding
- ☐  $\text{H}_2\text{Te}$  because of higher molecular weight
- ☐  $\text{H}_2\text{O}$  because of hydrogen bonding

Correct: +4 · Incorrect: -1

33 At  $100^\circ\text{C}$  and 1 atm if the density of the liquid water is  $1.0 \text{ g cm}^{-3}$  and that of water vapour is  $0.0006 \text{ g cm}^{-3}$ , then the volume occupied by water molecules in 1 L of steam at this temperature is

- ☐  $6 \text{ cm}^3$

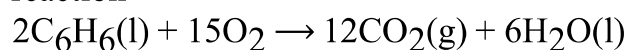
☐ 0.06 cm<sup>3</sup>

☐ 60 cm<sup>3</sup>

☐ 0.6 cm<sup>3</sup>

Correct: +4 · Incorrect: -1

34 The difference between heats of reaction at constant pressure and constant volume for the reaction



at 25<sup>0</sup> C in kJ is

☐ -7.43

☐ -3.72

☐ +3.72

☐ +7.43

Correct: +4 · Incorrect: -1

35 Anhydrous ferric chloride is prepared by

☐ heating hydrated ferric chloride at a high temperature in a stream of air

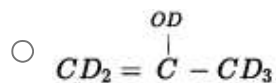
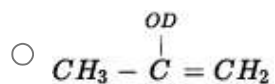
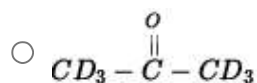
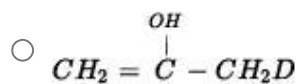
☐ reaction of metallic iron with hydrochloric acid

☐ reaction of metallic iron with nitric acid

- ☐ heating metallic iron in a stream of dry chlorine gas

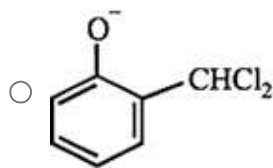
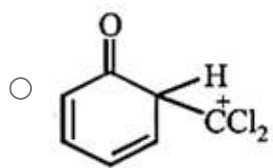
Correct: +4 · Incorrect: -1

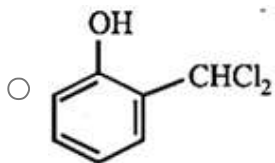
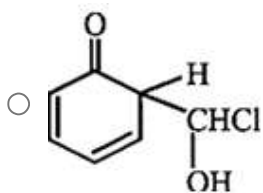
36 The enol form of acetone, after treatment with  $D_2O$ , gives



Correct: +4 · Incorrect: -1

37 When phenol is reacted with  $CHCl_3$  and  $NaOH$  followed by acidification, salicylaldehyde is obtained. Which of the following species are involved in the above-mentioned reaction as an intermediate?





Correct: +4 · Incorrect: -1

38  $\text{Fe}^{3+}$  cation gives a prussian blue precipitate on addition of potassium ferrocyanide solution due to the formation of

- ☐  $\text{Fe}_2[\text{Fe}(\text{CN})_6]_2$
- ☐  $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$
- ☐  $\text{Fe}_3[\text{Fe}(\text{OH})_2 (\text{CN})_4]_2$
- ☐  $[\text{Fe}(\text{H}_2\text{O})_6]_2 [\text{Fe}(\text{CN})_6]$

Correct: +4 · Incorrect: -1

39 The total number of stereoisomer formed by the given compound is



☐ 2

☐ 3

☐ 4

☐ 8

Correct: +4 · Incorrect: -1

40 What is the hydronium ion concentration of a 0.25 M HA solution(  $K_a = 4 \times 10^{-8}$

☐  $10^{-4}$

☐  $10^{-5}$

☐  $10^{-7}$

☐  $10^{-10}$

Correct: +4 · Incorrect: -1

41 Which of the following statements is incorrect?

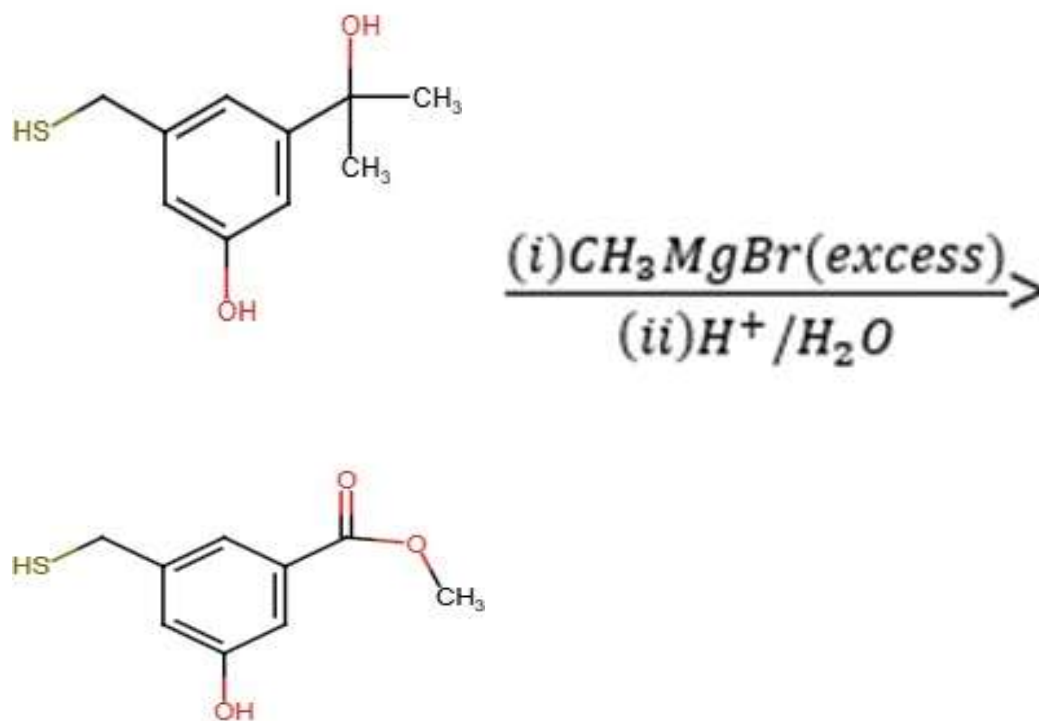
☐  $H^+$  is the smallest size cation in the periodic table.

- Van der Waals radius of chlorine is more than covalent radius.
- Ionic mobility of hydrated  $\text{Li}^+$  is greater than that of hydrated  $\text{Na}^+$
- He atom has the highest ionisation enthalpy in the periodic table

Correct: +4 · Incorrect: -1

42

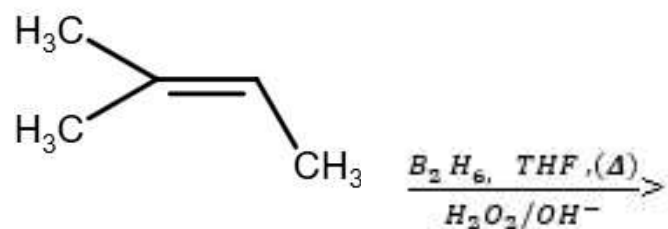
Moles of  $\text{CH}_3\text{MgBr}$  consumed per mole of reactant will be



- 4
- 2
- 6

○ 3

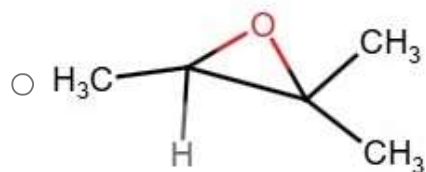
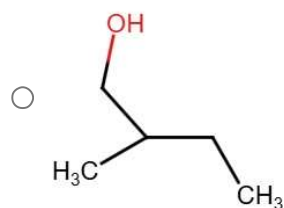
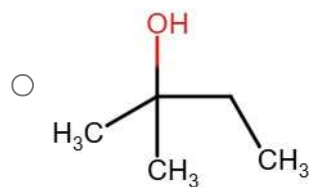
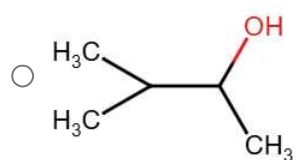
Correct: +4 · Incorrect: -1



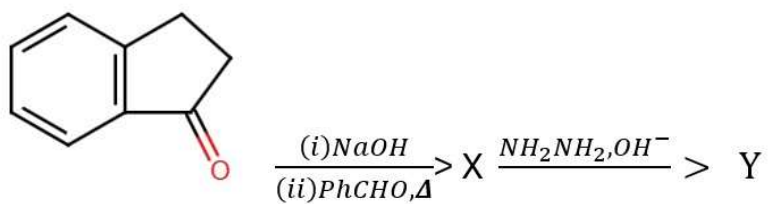
43

A

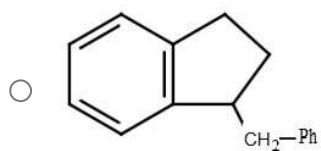
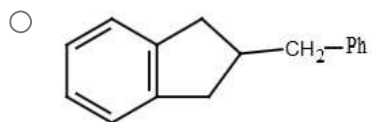
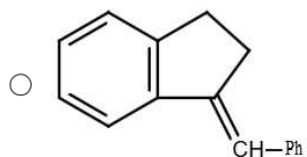
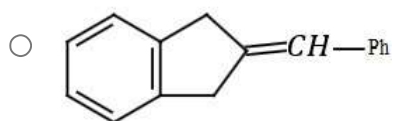
Product A is :



44



Product Y is :







The organic product of the above reaction is

- ☐  $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$
- ☐  $\text{CH}_3\text{CH}(\text{NH}_2)\text{CH}_3$
- ☐  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2$
- ☐  $\text{CH}_3\text{CH}_2\text{CH}(\text{NH}_2)\text{CH}_3$

Correct: +4 · Incorrect: -1

46 The difference in the oxidation numbers of the two types of sulphur atoms in  $\text{Na}_2\text{S}_4\text{O}_6$  is

Correct: +4 · Incorrect: -1

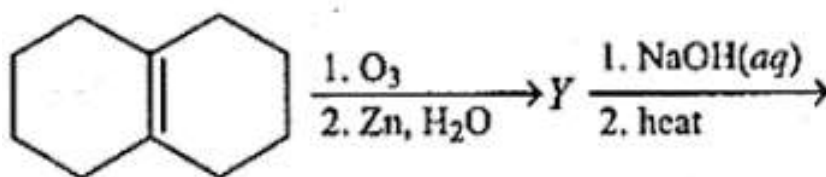
47 The rate of a first-order reaction is  $0.04 \text{ mol litre}^{-1} \text{ s}^{-1}$  at 10 minutes and  $0.03 \text{ mol litre}^{-1} \text{ s}^{-1}$  at 20 minutes after initiation. Find the half-life of the reaction.

Correct: +4 · Incorrect: -1

48 Resistance of a decimolar solution between two electrodes is 0.01m apart and  $0.002 \text{ m}^2$  area was found to be 50 ohm .If specific conductance is  $x \text{ ohm}^{-1} \text{ m}^{-1}$  then find the value of 10x

Correct: +4 · Incorrect: -1

- 49 In the scheme given below, the total number of intramolecular aldol condensation products formed from Y is



Correct: +4 · Incorrect: -1

- 50 In the complex acetyl bromidodicarbonylbis (triethylphosphine) iron (II), the number of Fe-C bond (s) is

Correct: +4 · Incorrect: -1

Section 3 : Maths - 25 Questions

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- 51 If  $(\pi/2) \leq x \leq (3\pi/4)$ , then  $\cos^{-1}((12/13) \cos x + (5/13) \sin x)$  is equal to:

- ☐  $x - \tan^{-1}(5/12)$
- ☐  $x + \tan^{-1}(5/12)$
- ☐  $x + \tan^{-1}(4/5)$
- ☐  $x - \tan^{-1}(4/3)$

Correct: +4 · Incorrect: -1

- 52 Let  $|(z - i) / (2z + i)| = 1/3$ ,  $z \in \mathbb{C}$ , be the equation of a circle with centre at C.

If the area of the triangle, whose vertices are at the points (0,0), C, and  $(\alpha, 0)$  is 11 square units, then  $\alpha^2$  equals:

- ☐ 81/25

- ☐ 100
- ☐ 50
- ☐ 121/25

Correct: +4 · Incorrect: -1

53 If A, B, and  $(\text{adj}(A^{-1}) + \text{adj}(B^{-1}))$  are non-singular matrices of same order, then the inverse of  $A(\text{adj}(A^{-1}) + \text{adj}(B^{-1}))B$ , is equal to

- ☐  $\frac{AB^{-1}}{|A|} + \frac{BA^{-1}}{|B|}$
- ☐  $\frac{1}{|AB|}(\text{adj}(B) + \text{adj}(A))$
- ☐  $AB^{-1} + BA^{-1}$
- ☐  $\text{adj}(B^{-1}) + \text{adj}(A^{-1})$

Correct: +4 · Incorrect: -1

54 Let  $R = \{(1,2), (2,3), (3,3)\}$  be a relation defined on the set  $\{1,2,3,4\}$ . Then the minimum number of elements, needed to be added in R so that R becomes an equivalence relation, is:

- ☐ 10
- ☐ 9

☐ 8

☐ 7

Correct: +4 · Incorrect: -1

55 The Value of  $\int_{e^2}^{e^4} \frac{1}{x} \left( \frac{e^{((\log_e x)^2 + 1)^{-1}}}{e^{((\log_e x)^2 + 1)^{-1}} + e^{((6 - \log_e x)^2 + 1)^{-1}}} \right) dx$  is

☐ 1

☐  $\text{Log}_e 2$

☐  $e^2$

☐ 2

Correct: +4 · Incorrect: -1

56 Let  $f(x) = \text{Log}_e x$  and  $g(x) = \frac{x^4 - 2x^3 + 3x^2 - 2x + 2}{2x^2 - 2x + 1}$  Then the domain of fog is

☐  $\mathbb{R}$

☐  $[0, \infty)$

☐  $[1, \infty)$

☐  $(0, \infty)$

Correct: +4 · Incorrect: -1

- 57 Let the arc AC of a circle subtend a right angle at the centre O. If the point B on the arc AC, divides the arc AC such that

$\frac{\text{Length of arc AB}}{\text{Length of arc BC}} = \frac{1}{5}$  and  $\overrightarrow{OC} = \alpha \overrightarrow{OA} + \beta \overrightarrow{OB}$  then  $\alpha + \sqrt{2}(\sqrt{3} - 1)\beta$  is equal to

- ☐  $2\sqrt{3}$
- ☐  $2 - \sqrt{3}$
- ☐  $2 + \sqrt{3}$
- ☐  $5\sqrt{3}$

Correct: +4 · Incorrect: -1

- 58 Let the area of a  $\triangle PQR$  with vertices P (5,4), Q(-2,4) and R (a,b) be 35 Square Units. If its orthocenter and centroid are O (2, 14/5) and C (c,d) respectively, then c + 2d is equal to

- ☐ 3
- ☐ 8/3
- ☐ 7/3
- ☐ 2

Correct: +4 · Incorrect: -1

- 59 Let the position vectors A, B and C of a tetrahedron ABCD be  $\hat{i} + 2\hat{j} + \hat{k}$ ,  $\hat{i} + 3\hat{j} - 2\hat{k}$  and  $2\hat{i} + \hat{j} - \hat{k}$  respectively. The altitude from the vertex D to the opposite face ABC meets the

median line segment through A of the triangle ABC at the point E. If the length of AD is  $\frac{\sqrt{110}}{3}$  and the volume of the tetrahedron is  $\frac{\sqrt{805}}{6\sqrt{2}}$ , then the position vector of E is

☐  $\frac{1}{12}(7\hat{i} + 4\hat{j} + 3\hat{k})$

☐  $\frac{1}{2}(\hat{i} + 4\hat{j} + 7\hat{k})$

☐  $\frac{1}{6}(7\hat{i} + 12\hat{j} + \hat{k})$

☐  $\frac{1}{6}(12\hat{i} + 12\hat{j} + \hat{k})$

Correct: +4 · Incorrect: -1

60 If the function

$$f(x) = \begin{cases} \frac{2}{x} \{ \sin(k_1 + 1)x + \sin(k_2 - 1)x \}, & x < 0 \\ 4 & , x = 0 \\ \frac{2}{x} \log_e \left( \frac{2 + k_1 x}{2 + k_2 x} \right) & , x > 0 \end{cases}$$

is continuous at  $x = 0$ , then  $k_1^2$  and  $k_2^2$  is equal to

☐ 20

☐ 5

☐ 10

☐ 8

Correct: +4 · Incorrect: -1

If the system of equations  $(\lambda-1)x + (\lambda-4)y + \lambda z = 5$ ,  $\lambda x + (\lambda-1)y + (\lambda-4)z = 7$  and  $(\lambda+1)x + (\lambda+2)y - (\lambda+2)z = 9$  has infinitely many solutions, then  $\lambda^2 + \lambda$  is equal to:

☐ 12

☐ 10

☐ 6

☐ 20

Correct: +4 · Incorrect: -1

62 Let  $I(x) = \int \frac{dx}{(x-11)^{\frac{11}{13}}(x+15)^{\frac{15}{13}}}$ . If  $I(37) - I(24) = \frac{1}{4} \left( \frac{1}{b^{\frac{1}{13}}} - \frac{1}{c^{\frac{1}{13}}} \right)$ ,  $b, c \in \mathbb{N}$ , then  $3(b + c)$  is equal to

☐ 40

☐ 39

☐ 22

☐ 26

Correct: +4 · Incorrect: -1

63 If the line  $3x - 2y + 12 = 0$  intersects the parabola  $4y = 3x^2$  at the points A and B, then at the vertex of the parabola, the line segment AB subtends an angle equal to

☐  $\tan^{-1} \frac{11}{9}$

☐  $\frac{\pi}{2} - \tan^{-1} \frac{3}{2}$

☐  $\tan^{-1} \frac{9}{7}$

☐  $\tan^{-1} \frac{4}{5}$

Correct: +4 · Incorrect: -1

64 The value of definite integral  $\int_{-\pi}^{\pi} \frac{x^2}{1 + \sin x + \sqrt{1 + \sin x * \sin x}} dx$  is

☐  $\frac{3\pi^3}{2}$

☐  $\frac{\pi^3}{3}$

☐  $\frac{2\pi^3}{3}$

☐  $\frac{\pi^3}{6}$

Correct: +4 · Incorrect: -1



65 Sequence  $\{t_n\}$  of positive terms is a G.p. If  $t_6, 2, 5, t_{14}$  form another G.P. in that order, then the product  $t_1 t_2 t_3 \dots t_{18} t_{19}$  is equal to

- ☐  $10^9$
- ☐  $10^{10}$
- ☐  $10^{17/2}$
- ☐  $10^{19/2}$

Correct: +4 · Incorrect: -1

66 The number of different values of  $\theta$  satisfying the equation  $\cos \theta + \cos 2\theta = -1$  and at the same time satisfying the condition  $0 < \theta < 360^\circ$  is

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4

Correct: +4 · Incorrect: -1

67 Let ABC be a triangle. Let A be the point (1,2),  $y = x$  be the perpendicular bisector of AB, and  $x - 2y + 1 = 0$  be the angle bisector of angle C. If the equation of BC is given by  $ax + by - 5 = 0$ , then the value of  $a + b$  is

☐ 1

☐ 2

☐ 3

☐ 4

Correct: +4 · Incorrect: -1

68 The Sixth term of an AP,  $a_1, a_2, a_3, \dots, a_n$  is 2. If the quantity  $a_1 a_4 a_5$  is minimum, then the common difference of the AP, is

☐  $2/3$

☐  $8/5$

☐  $1/3$

☐  $2/9$

Correct: +4 · Incorrect: -1

69 Let  $N$  denote the set of all Natural numbers and  $R$  be the relation on  $N \times N$  defined by  $(a,b) R(c,d)$  if  $ad(b+c) = bc(a+d)$ , then  $R$  is

☐ Symmetric Only

☐ Reflexive Only

☐ Transitive Only

☐ An equivalence relation

Correct: +4 · Incorrect: -1

70 If  $4\hat{i}+7\hat{j}+8\hat{k}$ ,  $2\hat{i}+3\hat{j}+4\hat{k}$ ,  $2\hat{i}+5\hat{j}+7\hat{k}$  are position vectors of A, B, C of  $\Delta ABC$  then position vector of the point where the bisector of angle A meets BC is

☐  $\left(2, \frac{13}{3}, 6\right)$

☐  $\left(-2, \frac{13}{3}, 6\right)$

☐  $\left(2, -\frac{13}{3}, 6\right)$

☐  $\left(2, \frac{13}{3}, -6\right)$

Correct: +4 · Incorrect: -1

71 If the set of all values of a, for which the equation  $5x^3 - 15x - a = 0$  has three distinct real roots, is the interval  $(\alpha, \beta)$ , then  $\beta - 2\alpha$  is equal to

Correct: +4 · Incorrect: -1

72 Minimum Integral value of K for which the equation  $e^x = Kx^2$  has exactly three real distinct solutions

Correct: +4 · Incorrect: -1

73 Consider the region  $A = \{(x, y) : x^2 + y^2 \leq 100\}$  and  $B = \{(x, y) : \sin(x+y) > 0\}$  in a plane. Then the area of the region  $A \cap B$  is  $K\pi$ , then  $K$  is

Correct: +4 · Incorrect: -1

74 If the area of the larger portion bounded between the curves  $x^2 + y^2 = 25$  and  $y = |x-1|$  is  $\frac{1}{4}(b\pi + c)$ ,  $b, c \in \mathbb{N}$ , then  $b+c$  is equal to

Correct: +4 · Incorrect: -1

75 The sum  $\frac{\binom{11}{0}}{1} + \frac{\binom{11}{1}}{2} + \frac{\binom{11}{2}}{3} + \dots + \frac{\binom{11}{11}}{12}$  is equal to  $\frac{m}{n}$  with  $\gcd(m, n) = 1$ , then  $m + n$  is

Correct: +4 · Incorrect: -1

TEST

## IIST JEE MAIN 2025 MOCK TEST

### ANSWERS

#### SECTIONS

1. Physics - 25 Questions
2. Chemistry - 25 Questions
3. Maths - 25 Questions

#### Section 1 : Physics - 25 Questions

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1  $\tan^{-1}(0.5)$

2 10

3 Zero,  $10 \hat{i}$  N

4 10

5 [Marks to all](#)

6 [Marks to all](#)

7 64

8  $4R$

9 12

10  $\omega_0 = 4V/R$ ,  $v_0 = V$

11 None is correct.

12 Only III and IV are correct.

13 Marks to all

14 Marks to all

15 Marks to all

16 3A

17 Marks to all

18  $1/15$  A,  $2/25$  A

19 a, b, c

20 0 Volt, 3A

21 4

22 1

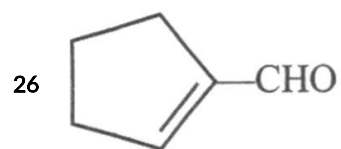
23 -0.61 - -0.59

24 0.49 -0.51

25 3.3 -3.4

## Section 2 : Chemistry - 25 Questions

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27 6a0

28 2.07 M

29 9,15

30 [Marks to all](#)

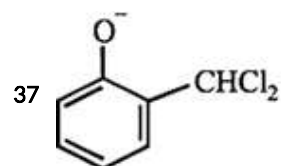
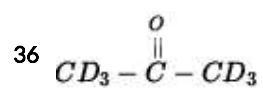
31  $(\text{CH}_3)_3\text{N}$

32  $\text{H}_2\text{O}$  because of hydrogen bonding

33  $0.6 \text{ cm}^3$

34 -7.43

35 heating metallic iron in a stream of dry chlorine gas



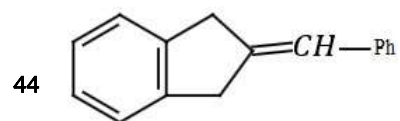
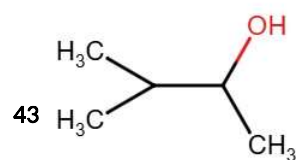
38  $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$

39 4

40  $10^{-4}$

41 Ionic mobility of hydrated  $\text{Li}^+$  is greater than that of hydrated  $\text{Na}^+$

42 4



45 [Marks to all](#)

46 5

47 24

48 1

49 1



Section 3 : Maths - 25 Questions

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51  $x - \tan^{-1}(5/12)$

52 100

53  $\frac{1}{|AB|}(adj(B) + adj(A))$

54 7

55 1

56  $\mathbb{R}$

57  $2 - \sqrt{3}$

58 3

59  $\frac{1}{6}(7\hat{i} + 12\hat{j} + \hat{k})$

60 10

61 12

62 39

63  $\tan^{-1} \frac{9}{7}$

64  $\frac{\pi^3}{3}$

65  $10^{19/2}$

66 4

67 2

68  $2/3$

69 An equivalence relation

70  $\left(2, \frac{13}{3}, 6\right)$

71 30

72 2

73 50

74 77

75 341.250 - 341.251

TEST

## IIST JEE MAIN 2025 MOCK TEST

### SOLUTIONS

#### SECTIONS

1. Physics - 25 Questions
2. Chemistry - 25 Questions
3. Maths - 25 Questions

#### Section 1 : Physics - 25 Questions

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Section 2 : Chemistry - 25 Questions

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### Section 3 : Maths - 25 Questions

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