

JEE MAIN 2026 · QUESTION PAPER

24 Jan 2026 **Shift 1**

75 questions in exam order, with answer key

Subject	Section A multiple choice	Section B numerical value
● Physics	20 Q1 to Q20	5 Q21 to Q25
● Chemistry	20 Q26 to Q45	5 Q46 to Q50
● Mathematics	20 Q51 to Q70	5 Q71 to Q75
In this PDF	75 questions · answer key at the end	

- 1 Set a 3 hour timer and attempt the paper in one sitting, like the real exam.
- 2 Check yourself against the answer key at the end. Every question names its chapter, so you can see where marks went.
- 3 Got one wrong? Tap “Step-by-step solution” at the top right of it for the full working, where available.

Attempt this paper online

The same questions in the same order, with instant answer checking and step-by-step solutions where available.

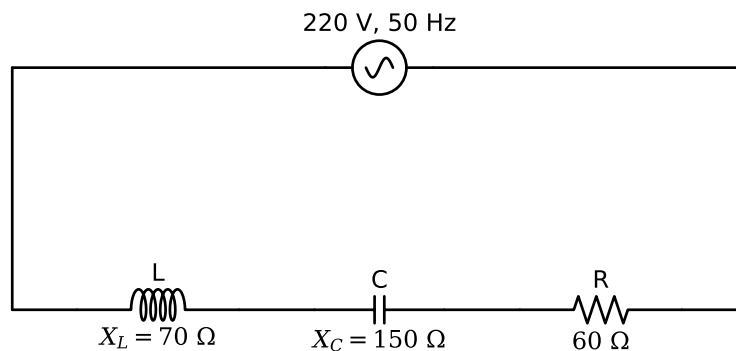
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Answers follow NTA's final answer keys. Typing errors are possible, so check doubtful answers against the official key. Spotted a mistake? prepwisser.in/feedback · Terms: prepwisser.in/terms

Q1 Alternating Current

[Step-by-step solution](#) › prepwiser.in/questions/ZAgjqPoIdg

For the series LCR circuit connected with 220V, 50Hz a.c source as shown in the figure, the power factor is $\frac{\alpha}{10}$. The value of α is ____.



- (A) 4 (B) 8 (C) 6 (D) 10

Q2 Electromagnetic Waves

[Step-by-step solution](#) › prepwiser.in/questions/nv-8EjkZXA

Match the LIST-I with LIST-II

List-I	List-II
A. Radio-wave	I. is produced by Magnetron valve
B. Micro-wave	II. due to change in the vibrational modes of atoms
C. Infrared-wave	III. due to inner shell electrons moving from higher energy level to lower energy level
D. X-ray	IV. due to rapid acceleration of electrons

Choose the correct answer from the options given below:

- (A) A-IV, B-II, C-I, D-III (B) A-IV, B-III, C-I, D-II (C) A-IV, B-I, C-II, D-III (D) A-II, B-IV, C-III, D-I

Q3 Gravitation

[Step-by-step solution](#) › prepwiser.in/questions/5ztEMPM2xi

Three masses 200kg, 300kg and 400 kg are placed at the vertices of an equilateral triangle with sides 20 m. They are rearranged on the vertices of a bigger triangle of side 25 m and with the same centre. The work done in this process ____ J. (Gravitational constant $G = 6.7 \times 10^{-11} \text{Nm}^2/\text{kg}^2$)

- (A) 4.77×10^{-7} (B) 1.74×10^{-7} (C) 9.86×10^{-6} (D) 2.85×10^{-7}

Q4 Rotational Motion

[Step-by-step solution](#) › prepwiser.in/questions/Vuiocv_C7q

Two masses 400 g and 350 g are suspended from the ends of a light string passing over a heavy pulley of radius 2 cm. When released from rest the heavier mass is observed to fall 81 cm in 9 s. The rotational inertia of the pulley is ____ $\text{kg} \cdot \text{m}^2$. ($g = 9.8 \text{m/s}^2$)

- (A) 8.3×10^{-3} (B) 4.75×10^{-3} (C) 1.86×10^{-2} (D) 9.5×10^{-3}

Q5 Atomic Physics

[Step-by-step solution](#) › prepwiser.in/questions/fdFvUpNWnY

Two electrons are moving in orbits of two hydrogen like atoms with speeds $3 \times 10^5 \text{m/s}$ and $2.5 \times 10^5 \text{m/s}$ respectively. If the radii of these orbits are nearly same then the possible order of energy states are ____ respectively.

- (A) 8 and 10 (B) 10 and 12 (C) 9 and 8 (D) 6 and 5

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Given below are two statements:

Statement I: For all elements, greater the mass of the nucleus, greater is the binding energy per nucleon.

Statement II: For all elements, nuclei with less binding energy per nucleon transforms to nuclei with greater binding energy per nucleon.

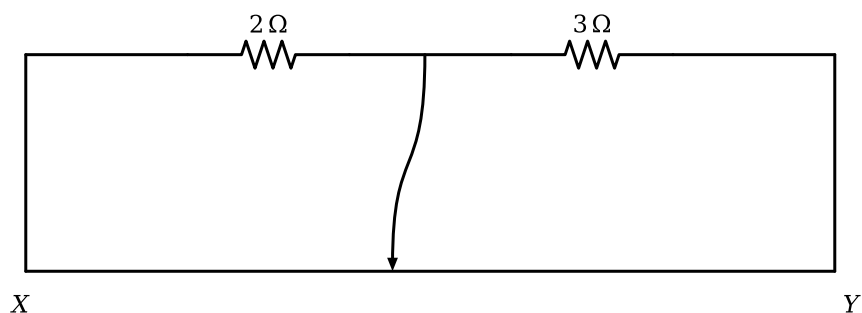
In the light of the above statements, choose the correct answer from the options given below

- (A) Statement I is false but Statement II is true (B) Both Statement I and Statement II are true
(C) Both Statement I and Statement II are false (D) Statement I is true but Statement II is false

Two resistors of 100Ω each are connected in series with a 9 V battery. A voltmeter of 400Ω resistance is connected to measure the voltage drop across one of the resistors. The voltmeter reading is ____ V.

- (A) 3 (B) 2 (C) 4 (D) 4.5

Two resistors 2Ω and 3Ω are connected in the gaps of bridge as shown in figure. The null point is obtained with the contact of jockey at some point on wire XY . When an unknown resistor is connected in parallel with 3Ω resistor, the null point is shifted by 22.5 cm toward Y . The resistance of unknown resistor is ____ Ω .



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

Density of water at 4°C and 20°C are 1000kg/m^3 and 998kg/m^3 respectively. The increase in internal energy of 4 kg of water when it is heated from 4°C to 20°C is ____ J.

(specific heat capacity of water = 4.2J/kg . and 1 atmospheric pressure = 10^5Pa)

- (A) 268799.2 (B) 315826.2 (C) 234699.2 (D) 258700.8

A boy throws a ball into air at 45° from the horizontal to land it on a roof of a building of height H . If the ball attains maximum height in 2 s and lands on the building in 3 s after launch, then value of H is ____ m.

($g = 10\text{m/s}^2$)

- (A) 20 (B) 25 (C) 10 (D) 15

Q11 Simple Harmonic Motion[Step-by-step solution](#) › [prepwisar.in/questions/QshJEG_-58](https://www.prepwisar.in/questions/QshJEG_-58)

A cylindrical block of mass M and area of cross section A is floating in a liquid of density ρ and with its axis vertical. When depressed a little and released the block starts oscillating. The period of oscillation is _____

- (A) $2\pi\sqrt{\frac{\rho A}{Mg}}$ (B) $\pi\sqrt{\frac{2M}{\rho Ag}}$ (C) $2\pi\sqrt{\frac{M}{\rho Ag}}$ (D) $\pi\sqrt{\frac{\rho A}{Mg}}$

Q12 Simple Harmonic Motion[Step-by-step solution](#) › [prepwisar.in/questions/jb1TQftsHK](https://www.prepwisar.in/questions/jb1TQftsHK)

A spring of force constant 15 N/m is cut into two pieces. If the ratio of their length is $1 : 3$, then the force constant of smaller piece is _____ N/m .

- (A) 20 (B) 45 (C) 60 (D) 15

Q13 Electrostatics I: Charges, Field & Gauss's Law[Step-by-step solution](#) › [prepwisar.in/questions/0Sg3KIijq](https://www.prepwisar.in/questions/0Sg3KIijq)

The electrostatic potential in a charged spherical region of radius r varies as $V = ar^3 + b$, where a and b are constants. The total charge in the sphere of unit radius is $\alpha \times \pi a \epsilon_0$. The value of α is _____. (permittivity of vacuum is ϵ_0)

- (A) -12 (B) -8 (C) -9 (D) -6

Q14 Electrostatics II: Potential & Capacitance[Step-by-step solution](#) › [prepwisar.in/questions/mrFtOlw9kH](https://www.prepwisar.in/questions/mrFtOlw9kH)

There are three co-centric conducting spherical shells A , B and C of radii a , b and c respectively ($c > b > a$) and they are charged with charge q_1 , q_2 and q_3 respectively. The potentials of the spheres A , B and C respectively, are:

- (A) $\frac{1}{4\pi\epsilon_0} \left(\frac{q_1}{a} + \frac{q_2}{b} + \frac{q_3}{c} \right)$, $\frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2+q_3}{b} \right)$, $\frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2+q_3}{c} \right)$
 (B) $\frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2+q_3}{a} \right)$, $\frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2+q_3}{b} \right)$, $\frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2+q_3}{c} \right)$
 (C) $\frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2+q_3}{a} \right)$, $\frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2}{b} + \frac{q_3}{c} \right)$, $\frac{1}{4\pi\epsilon_0} \left(\frac{q_1}{a} + \frac{q_2}{b} + \frac{q_3}{c} \right)$
 (D) $\frac{1}{4\pi\epsilon_0} \left(\frac{q_1}{a} + \frac{q_2}{b} + \frac{q_3}{c} \right)$, $\frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2}{b} + \frac{q_3}{c} \right)$, $\frac{1}{4\pi\epsilon_0} \left(\frac{q_1+q_2+q_3}{c} \right)$

Q15 Electrostatics I: Charges, Field & Gauss's Law[Step-by-step solution](#) › [prepwisar.in/questions/mgCiXmnNW6](https://www.prepwisar.in/questions/mgCiXmnNW6)

Three charges $+2q$, $+3q$ and $-4q$ are situated at $(0, -3a)$, $(2a, 0)$ and $(-2a, 0)$ respectively in the xy plane. The resultant dipole moment about origin is _____.

- (A) $2qa(7\hat{i} - 3\hat{j})$ (B) $2qa(3\hat{j} - 7\hat{i})$ (C) $2qa(3\hat{i} - 7\hat{j})$ (D) $2qa(3\hat{j} - \hat{i})$

Q16 Units, Dimensions & Errors[Step-by-step solution](#) › [prepwisar.in/questions/93GRQgt43p](https://www.prepwisar.in/questions/93GRQgt43p)

Match the LIST-I with LIST-II

List-I	List-II
A. Magnetic induction	I. $MLT^{-2}A^{-2}$
B. Magnetic flux	II. $ML^2T^{-2}A^{-2}$
C. Magnetic permeability	III. $ML^0T^{-2}A^{-1}$
D. Self inductance	IV. $ML^2T^{-2}A^{-1}$

Choose the correct answer from the options given below:

- (A) A-III, B-IV, C-II, D-I (B) A-I, B-III, C-IV, D-II (C) A-IV, B-III, C-I, D-II (D) A-III, B-IV, C-I, D-II

Q17 Ray Optics[Step-by-step solution](#) > [prepwiser.in/questions/XA2cisxEkn](https://www.prepwiser.in/questions/XA2cisxEkn)

The exit surface of a prism with refractive index n is coated with a material having refractive index $\frac{n}{2}$. When this prism is set for minimum angle of deviation, it exactly meets the condition of critical angle. The prism angle is ____.

- (A) 60° (B) 30° (C) 15° (D) 45°

Q18 Wave Optics[Step-by-step solution](#) > [prepwiser.in/questions/uwf4uSAYdw](https://www.prepwiser.in/questions/uwf4uSAYdw)

An unpolarised light is incident at an interface of two dielectric media having refractive indices of 2 (incident medium) and $2\sqrt{3}$ (medium) respectively. To satisfy the condition that reflected and refracted rays are perpendicular to each other, the angle of incidence is ____

- (A) 45° (B) 60° (C) 10° (D) 30°

Q19 Ray Optics[Step-by-step solution](#) > [prepwiser.in/questions/lw-zV-qEtz](https://www.prepwiser.in/questions/lw-zV-qEtz)

In a microscope of tube length 10 cm two convex lenses are arranged with focal length of 2 cm and 5 cm. Total magnification obtained with this system for normal adjustment is $(5)^k$. The value of k is ____.

- (A) 4 (B) 5 (C) 2 (D) 3.5

Q20 Elasticity[Step-by-step solution](#) > [prepwiser.in/questions/jdnQD3_Vto](https://www.prepwiser.in/questions/jdnQD3_Vto)

A brass wire of length 2 m and radius 1 mm at 27°C is held taut between two rigid supports. Initially it was cooled to a temperature of -43°C creating a tension T in the wire. The temperature to which the wire has to be cooled in order to increase the tension in it to $1.4T$, is ____ $^\circ\text{C}$.

- (A) -71 (B) -80 (C) -65 (D) -86

Physics Section B · Numerical value

Q21 to Q25

Q21 Semiconductors & Electronic Devices**NUMERICAL**[Step-by-step solution](#) > [prepwiser.in/questions/3v3EtKCTTN](https://www.prepwiser.in/questions/3v3EtKCTTN)

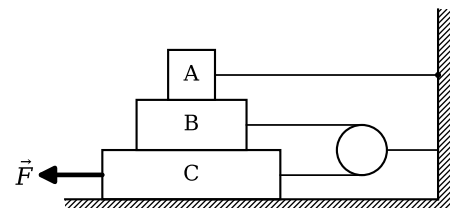
A voltage regulating circuit consisting of Zener diode, having break-down voltage of 10 V and maximum power dissipation of 0.4 W, is operated at 15 V. The approximate value of protective resistance in this circuit is ____ Ω .

Q22 Kinetic Theory of Gases**NUMERICAL**[Step-by-step solution](#) > [prepwiser.in/questions/e3YjGtya_s](https://www.prepwiser.in/questions/e3YjGtya_s)

A gas of certain mass filled in a closed cylinder at a pressure of 3.23 kPa has temperature 50°C . The gas is now heated to double its temperature on the Celsius scale. The modified pressure is ____ Pa.

Q23 Friction**NUMERICAL**[Step-by-step solution](#) > [prepwiser.in/questions/CHO4LGid75](https://www.prepwiser.in/questions/CHO4LGid75)

In the given figure the blocks A, B and C weigh 4 kg, 6 kg and 8 kg respectively. The co-efficient of sliding friction between any two surfaces is 0.5. The force $\vec{F}$ required to slide the block C with constant speed is ____ N. (Use $g = 10\text{m/s}^2$)

**Q24** Magnetism & Matter**NUMERICAL**[Step-by-step solution](#) > [prepwiser.in/questions/MVaxqnFxrB](https://www.prepwiser.in/questions/MVaxqnFxrB)

A short bar magnet placed with its axis at 30° with an external field of 800 Gauss, experiences a torque of $0.016\text{N}\cdot\text{m}$. The work done in moving it from most stable to most unstable position is $\alpha \times 10^{-3}\text{J}$. The value of α is ____.

Sixty four rain drops of radius 1 mm each falling down with a terminal velocity of 10cm/s coalesce to form a bigger drop. The terminal velocity of bigger drop is _____ cm/s.

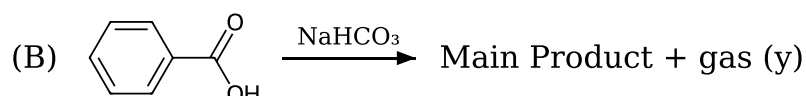
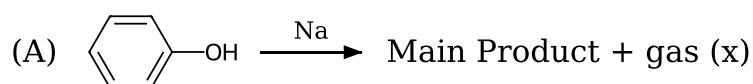
Chemistry Section A · Multiple choice

Q26 to Q45

Q26 Aldehydes & Ketones

Step-by-step solution > [prepwisar.in/questions/eK94pzkfBw](https://www.prepwisar.in/questions/eK94pzkfBw)

Consider the following two reactions A and B.



Numerical value of [molar mass of x + molar mass of y] is _____

(A) 46

(B) 160

(C) 88

(D) 4

Q27 Aldehydes & Ketones

Step-by-step solution > [prepwisar.in/questions/Vq9-jfPpJp](https://www.prepwisar.in/questions/Vq9-jfPpJp)

A student is given one compound among the following compounds that gives positive test with Tollen's reagent.

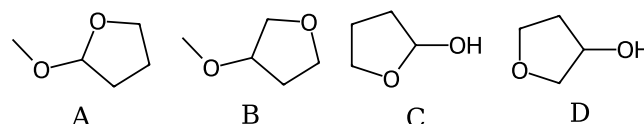
The compound is:

(A) B

(B) D

(C) A

(D) C



Q28 Coordination Compounds

Step-by-step solution > [prepwisar.in/questions/HZeq3fw5kf](https://www.prepwisar.in/questions/HZeq3fw5kf)

Given below are two statements:

Statement I: Hybridisation, shape and spin only magnetic moment of $K_3[Co(CO_3)_3]$ is sp^3d^2 , octahedral and 4.9 BM respectively.

Statement II: Geometry, hybridisation and spin only magnetic moment values (BM) of the ions $[Ni(CN)_4]^{2-}$, $[MnBr_4]^{2-}$ and $[CoF_6]^{3-}$ respectively are square planar, tetrahedral, octahedral; dsp^2 , sp^3 , sp^3d^2 and 0, 5.9, 4.9.

In the light of the above statements, choose the correct answer from the options given below

(A) Both Statement I and Statement II are false

(B) Statement I is true but Statement II is false

(C) Both Statement I and Statement II are true

(D) Statement I is false but Statement II is true

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Given below are two statements:

Statement I: The number of paramagnetic species among $[\text{CoF}_6]^{3-}$, $[\text{TiF}_6]^{3-}$, V_2O_5 and $[\text{Fe}(\text{CN})_6]^{3-}$ is 3.

Statement II:

$\text{K}_4[\text{Fe}(\text{CN})_6] < \text{K}_3[\text{Fe}(\text{CN})_6] < [\text{Fe}(\text{H}_2\text{O})_6]\text{SO}_4 \cdot \text{H}_2\text{O} < [\text{Fe}(\text{H}_2\text{O})_6]\text{Cl}_3$ is the correct order in terms of number of unpaired electron(s) present in the complexes.

In the light of the above statements, choose the correct answer from the options given below

- (A) Statement I is true but Statement II is false (B) Both Statement I and Statement II are false
(C) Statement I is false but Statement II is true (D) Both Statement I and Statement II are true

Consider a mixture 'X' which is made by dissolving 0.4 mol of $[\text{Co}(\text{NH}_3)_5\text{SO}_4]\text{Br}$ and 0.4 mol of $[\text{Co}(\text{NH}_3)_5\text{Br}]\text{SO}_4$ in water to make 4 L of solution. When 2 L of mixture 'X' is allowed to react with excess of AgNO_3 , it forms precipitate 'Y'. The rest 2 L of mixture 'X' reacts with excess BaCl_2 to form precipitate 'Z'. Which of the following statements is CORRECT?

- (A) 0.1 mol of 'Y' is formed. (B) 0.4 mol of 'Z' is formed.
(C) 0.2 mol of 'Z' is formed. (D) 'Y' is BaSO_4 and 'Z' is AgBr .

Consider three metal chlorides x, y and z, where x is water soluble at room temperature, y is sparingly soluble in water at room temperature and z is soluble in hot water. x, y and z are respectively

- (A) AgCl , Hg_2Cl_2 and PbCl_2 (B) CuCl_2 , AgCl and PbCl_2
(C) AlCl_3 , PbCl_2 and BaCl_2 (D) MgCl_2 , AgCl and AlCl_3

Arrange the following carbanions in the decreasing order of stability.

- I. $p\text{-Br-C}_6\text{H}_4\text{-}\ddot{\text{C}}\text{H}_2^\ominus$
II. $\text{C}_6\text{H}_5\text{-}\ddot{\text{C}}\text{H}_2^\ominus$
III. $p\text{-CH}_3\text{O-C}_6\text{H}_4\text{-}\ddot{\text{C}}\text{H}_2^\ominus$
IV. $p\text{-CHO-C}_6\text{H}_4\text{-}\ddot{\text{C}}\text{H}_2^\ominus$
V. $p\text{-CH}_3\text{-C}_6\text{H}_4\text{-}\ddot{\text{C}}\text{H}_2^\ominus$

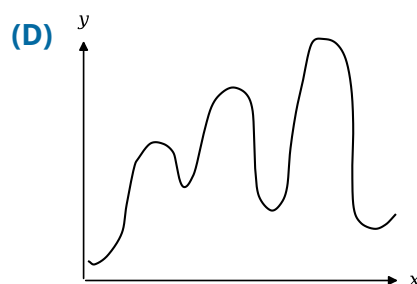
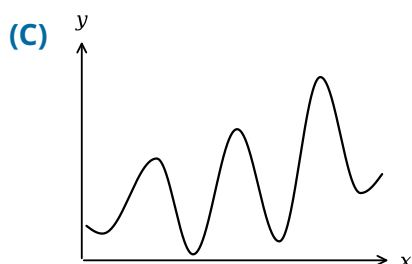
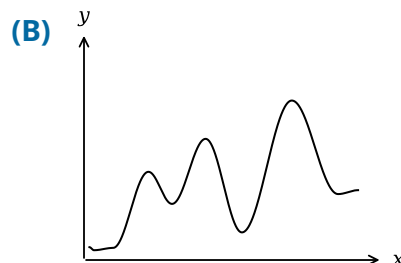
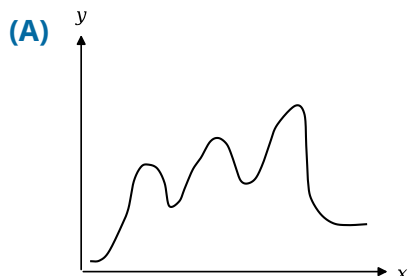
Choose the correct answer from the options given below:

- (A) $\text{I} > \text{II} > \text{IV} > \text{V} > \text{III}$ (B) $\text{IV} > \text{II} > \text{I} > \text{III} > \text{V}$
(C) $\text{I} > \text{IV} > \text{II} > \text{V} > \text{III}$ (D) $\text{IV} > \text{I} > \text{II} > \text{V} > \text{III}$

$A \rightarrow D$ is an endothermic reaction occurring in three steps (elementary).



Which of the following graphs between potential energy (y -axis) vs reaction coordinate (x -axis) correctly represents the reaction profile of $A \rightarrow D$?



At 27°C in presence of a catalyst, activation energy of a reaction is lowered by 10kJmol^{-1} . The logarithm of ratio of $\frac{k(\text{catalysed})}{k(\text{uncatalysed})}$ is....

(Consider that the frequency factor for both the reactions is same)

(A) 1.741

(B) 0.1741

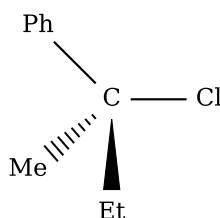
(C) 17.41

(D) 3.482

Given below are two statements:

Statement I: 'C – Cl' bond is stronger in $\text{CH}_2 = \text{CH} - \text{Cl}$ than $\text{CH}_3 - \text{CH}_2 - \text{Cl}$

Statement II: The given optically active molecule,



on

hydrolysis gives a solution that can rotate the plane polarized light.

In the light of the above statements, choose the correct answer from the options given below

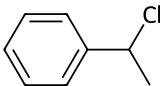
(A) Statement I is false but Statement II is true

(B) Statement I is true but Statement II is false

(C) Both Statement I and Statement II are true

(D) Both Statement I and Statement II are false

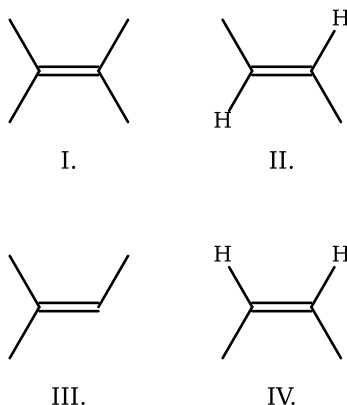
Match the List-I with List-II

List-I Chloro derivative	List-II Example
A. Vinyl Chloride	I. $\text{CH}_2 = \text{CH} - \text{CH}_2\text{Cl}$
B. Benzyl Chloride	II. $\text{CH}_3 - \text{CH}(\text{Cl})\text{CH}_3$
C. Alkyl Chloride	III. $\text{CH}_2 = \text{CHCl}$
D. Allyl Chloride	IV. 

Choose the **correct** answer from the options given below:

- (A) A-III, B-IV, C-I, D-II (B) A-IV, B-I, C-III, D-II (C) A-III, B-IV, C-II, D-I (D) A-I, B-II, C-IV, D-III

Arrange the following alkenes in decreasing order of stability.



Choose the correct answer from the options given below:

- (A) III > I > II > IV (B) III > II > I > IV (C) I > III > II > IV (D) I > III > IV > II

A solution is prepared by dissolving 0.3 g of a non-volatile non-electrolyte solute 'A' of molar mass 60g mol^{-1} and 0.9 g of a non-volatile non-electrolyte solute 'B' of molar mass 180g mol^{-1} in $100\text{mL H}_2\text{O}$ at 27°C . Osmotic pressure of the solution will be

[Given: $R = 0.082\text{LatmK}^{-1}\text{mol}^{-1}$]

- (A) 2.46 atm (B) 0.82 atm (C) 1.47 atm (D) 1.23 atm

'W' g of a non-volatile electrolyte solid solute of molar mass 'M' g mol^{-1} when dissolved in 100 mL water, decreases vapour pressure of water from 640 mm Hg to 600 mm Hg. If aqueous solution of the electrolyte boils at 375 K and K_b for water is 0.52K kg mol^{-1} , then the mole fraction of the electrolyte solute (x_2) in the solution can be expressed as

(Given : density of water = 1g/mL and boiling point of water = 373K)

- (A) $\frac{16}{2 \cdot 6} \times \frac{W}{M}$ (B) $\frac{1 \cdot 3}{8} \times \frac{M}{W}$ (C) $\frac{2 \cdot 6}{16} \times \frac{M}{W}$ (D) $\frac{1 \cdot 3}{8} \times \frac{W}{M}$

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Match the LIST-I with LIST-II

List-I Isothermal process for ideal gas system		List-II Work done ($V_f > V_i$)	
A.	Reversible expansion	I.	$w = 0$
B.	Free expansion	II.	$w = -nRT \ln \left(\frac{V_f}{V_i} \right)$
C.	Irreversible expansion	III.	$w = -p_{\text{ex}}(V_f - V_i)$
D.	Irreversible compression	IV.	$w = -p_{\text{ex}}(V_i - V_f)$

Choose the correct answer from the options given below:

- (A) A-IV, B-I, C-III, D-II (B) A-I, B-III, C-II, D-IV (C) A-II, B-I, C-III, D-IV (D) A-IV, B-II, C-III, D-I

A hydroxy compound (X) with molar mass 122g mol^{-1} is acetylated with acetic anhydride, using a large excess of the reagent ensuring complete acetylation of all hydroxyl groups. The product obtained has a molar mass of 290g mol^{-1} . The number of hydroxyl groups present in compound (X) is:

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

Given below are statements about some molecules/ions.

Identify the CORRECT statements.

- A. The dipole moment value of NF_3 is higher than that of NH_3 .
 B. The dipole moment value of BeH_2 is zero.
 C. The bond order of O_2^{2-} and F_2 is same.
 D. The formal charge on the central oxygen atom of ozone is -1.
 E. In NO_2 , all the three atoms satisfy the octet rule, hence it is very stable.

Choose the correct answer from the options given below:

- (A) B & C Only (B) B, C & D Only (C) A, C & D Only (D) A, B, C, D & E

Among the following, the CORRECT combinations are

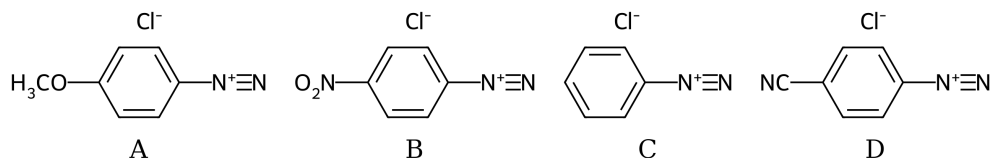
- A. $\text{IF}_3 \rightarrow \text{T-shaped} (sp^3d)$
 B. $\text{IF}_5 \rightarrow \text{Square pyramidal} (sp^3d^2)$
 C. $\text{IF}_7 \rightarrow \text{Pentagonal bipyramidal} (sp^3d^3)$
 D. $\text{ClO}_4^- \rightarrow \text{Square planar} (sp^2d)$

Choose the correct answer from the options given below:

- (A) B, C and D Only (B) A, B, C and D (C) A, B and C Only (D) A and B Only

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The correct stability order of the following diazonium salts is



- (A) $C > D > B > A$ (B) $A > C > D > B$ (C) $A > B > C > D$ (D) $C > A > D > B$

Given below are two statements:

Statement I: $K > Mg > Al > B$ is the correct order in terms of metallic character.

Statement II: Atomic radius is always greater than the ionic radius for any element.

In the light of the above statements, choose the correct answer from the options given below

- (A) Both Statement I and Statement II are false (B) Statement I is false but Statement II is true
(C) Statement I is true but Statement II is false (D) Both Statement I and Statement II are true

Chemistry Section B · Numerical value

Q46 to Q50

Consider two Group IV metal ions X^{2+} and Y^{2+} .

A solution containing $0.01MX^{2+}$ and $0.01MY^{2+}$ is saturated with H_2S . The pH at which the metal sulphide YS will form as a precipitate is _____. (Nearest integer)

(Given: $K_{sp}(XS) = 1 \times 10^{-22}$ at $25^\circ C$, $K_{sp}(YS) = 4 \times 10^{-16}$ at $25^\circ C$, $[H_2S] = 0.1M$ in solution, $K_{a1} \times K_{a2}(H_2S) = 1.0 \times 10^{-21}$, $\log 2 = 0.30$, $\log 3 = 0.48$, $\log 5 = 0.70$)

The hydrogen spectrum consists of several spectral lines in Lyman series ($L_1, L_2, L_3 \dots$; L_1 has lowest energy among Lyman series). Similarly it consists of several spectral lines in Balmer series ($B_1, B_2, B_3 \dots$; B_1 has lowest energy among Balmer lines). The energy of L_1 is x times the energy of B_1 . The value of x is $\times 10^{-1}$. (Nearest integer)

In Dumas method for estimation of nitrogen, 0.50 g of an organic compound gave 70 mL of nitrogen collected at 300 K and 715 mm pressure. The percentage of nitrogen in the organic compound is ____%.

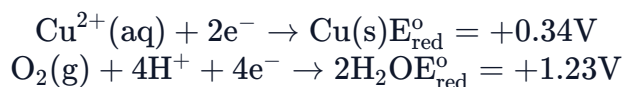
(Aqueous tension at 300 K is 15 mm).

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Q49 Electrochemistry **NUMERICAL**[Step-by-step solution](https://www.prepwiser.in/questions/B92KMwjIps) › prepwiser.in/questions/B92KMwjIps

Electricity is passed through an acidic solution of Cu^{2+} till all the Cu^{2+} was exhausted, leading to the deposition of 300 mg of Cu metal. However, a current of 600 mA was continued to pass through the same solution for another 28 minutes by keeping the total volume of the solution fixed at 200 mL. The total volume of oxygen evolved at STP during the entire process is ____ mL. (Nearest integer)

[Given:



Molar mass of Cu = 63.54g mol^{-1}

Molar mass of O_2 = 32g mol^{-1}

Faraday Constant = 96500C mol^{-1}

Molar volume at STP = 22.4L]

Q50 Redox Reactions **NUMERICAL**[Step-by-step solution](https://www.prepwiser.in/questions/88Asm5mvux) › prepwiser.in/questions/88Asm5mvux

X and Y are the number of electrons involved, respectively during the oxidation of I^- to I_2 and S^{2-} to S by acidified $\text{K}_2\text{Cr}_2\text{O}_7$. The value of $X + Y$ is ____.

Mathematics Section A · Multiple choice

Q51 to Q70

Q51 Complex Numbers[Step-by-step solution](https://www.prepwiser.in/questions/GZmXaykX2a) › prepwiser.in/questions/GZmXaykX2a

Let $S = \left\{ z \in \mathbb{C} : \left| \frac{z-6i}{z-2i} \right| = 1 \text{ and } \left| \frac{z-8+2i}{z+2i} \right| = \frac{3}{5} \right\}$.

Then $\sum_{z \in S} |z|^2$ is equal to:

- (A) 413 (B) 398 (C) 385 (D) 423

Q52 Ellipse[Step-by-step solution](https://www.prepwiser.in/questions/ULFnBGD28V) › prepwiser.in/questions/ULFnBGD28V

Let each of the two ellipses $E_1 : \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1, (a > b)$ and $E_2 : \frac{x^2}{A^2} + \frac{y^2}{B^2} = 1, (A < B)$ have eccentricity $\frac{4}{5}$. Let the lengths of the latus recta of E_1 and E_2 be l_1 and l_2 , respectively, such that $2l_1^2 = 9l_2^2$. If the distance between the foci of E_1 is 8, then the distance between the foci of E_2 is

- (A) $\frac{96}{5}$ (B) $\frac{8}{5}$ (C) $\frac{16}{5}$ (D) $\frac{32}{5}$

Q53 Indefinite Integration[Step-by-step solution](https://www.prepwiser.in/questions/6F7K8b7BeN) › prepwiser.in/questions/6F7K8b7BeN

Let $f(t) = \int \left(\frac{1 - \sin(\log_e t)}{1 - \cos(\log_e t)} \right) dt, t > 1$.

If $f(e^{\pi/2}) = -e^{\pi/2}$ and $f(e^{\pi/4}) = \alpha e^{\pi/4}$, then α equals

- (A) $1 + \sqrt{2}$ (B) $-1 - 2\sqrt{2}$ (C) $-1 - \sqrt{2}$ (D) $-1 + \sqrt{2}$

Q54 Statistics[Step-by-step solution](https://www.prepwiser.in/questions/4eYDiBWdUB) › prepwiser.in/questions/4eYDiBWdUB

The mean and variance of a data of 10 observations are 10 and 2, respectively. If an observations α in this data is replaced by β , then the mean and variance become 10.1 and 1.99, respectively. Then $\alpha + \beta$ equals

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

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Q55 Vectors[Step-by-step solution](#) › [prepwiser.in/questions/9w5Mm-pMI3](#)

Let $\vec{a} = 2\hat{i} + \hat{j} - 2\hat{k}$, $\vec{b} = \hat{i} + \hat{j}$ and $\vec{c} = \vec{a} \times \vec{b}$. Let $\vec{d}$ be a vector such that $|\vec{d} - \vec{a}| = \sqrt{11}$, $|\vec{c} \times \vec{d}| = 3$ and the angle between $\vec{c}$ and $\vec{d}$ is $\frac{\pi}{4}$. Then $\vec{a} \cdot \vec{d}$ is equal to

- (A) 0 (B) 1 (C) 3 (D) 11

Q56 Three Dimensional Geometry[Step-by-step solution](#) › [prepwiser.in/questions/rmPT-G_RuU](#)

Let the lines $L_1 : \vec{r} = \hat{i} + 2\hat{j} + 3\hat{k} + \lambda(2\hat{i} + 3\hat{j} + 4\hat{k})$, $\lambda \in \mathbb{R}$ and $L_2 : \vec{r} = (4\hat{i} + \hat{j}) + \mu(5\hat{i} + 2\hat{j} + \hat{k})$, $\mu \in \mathbb{R}$, intersect at the point R. Let P and Q be the points lying on lines L_1 and L_2 , respectively, such that $|\overrightarrow{PR}| = \sqrt{29}$ and $|\overrightarrow{PQ}| = \sqrt{\frac{47}{3}}$. If the point P lies in the first octant, then $27(QR)^2$ is equal to

- (A) 360 (B) 348 (C) 320 (D) 340

Q57 Area Under Curves[Step-by-step solution](#) › [prepwiser.in/questions/Gx3iiRtXxl](#)

Let A_1 be the bounded area enclosed by the curves $y = x^2 + 2$, $x + y = 8$ and y -axis that lies in the first quadrant. Let A_2 be the bounded area enclosed by the curves $y = x^2 + 2$, $y^2 = x$, $x = 2$, and y -axis that lies in the first quadrant. Then $A_1 - A_2$ is equal to

- (A) $\frac{2}{3}(2\sqrt{2} + 1)$ (B) $\frac{2}{3}(3\sqrt{2} + 1)$ (C) $\frac{2}{3}(\sqrt{2} + 1)$ (D) $\frac{2}{3}(4\sqrt{2} + 1)$

Q58 Quadratic Equations & Polynomial Inequalities[Step-by-step solution](#) › [prepwiser.in/questions/Hrq6IwYEW8](#)

The number of the real solutions of the equation: $x|x + 3| + |x - 1| - 2 = 0$ is

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

Q59 Quadratic Equations & Polynomial Inequalities[Step-by-step solution](#) › [prepwiser.in/questions/pvgv7H20K2](#)

If the domain of the function

$$f(x) = \log_{(10x^2 - 17x + 7)}(18x^2 - 11x + 1)$$

is $(-\infty, a) \cup (b, c) \cup (d, \infty) - \{e\}$, then

$90(a + b + c + d + e)$ equals:

- (A) 170 (B) 316 (C) 177 (D) 307

Q60 Straight Lines[Step-by-step solution](#) › [prepwiser.in/questions/_NYW8fv7wm](#)

Let $A(1, 0)$, $B(2, -1)$ and $C(\frac{7}{3}, \frac{4}{3})$ be three points. If the equation of the bisector of the angle ABC is $\alpha x + \beta y = 5$, then the value of $\alpha^2 + \beta^2$ is

- (A) 5 (B) 10 (C) 8 (D) 13

Q61 Binomial Theorem[Step-by-step solution](#) › [prepwiser.in/questions/QDOG0PQT28](#)

Let $S = \frac{1}{25!} + \frac{1}{3!23!} + \frac{1}{5!21!} + \dots$ up to 13 terms. If $13S = \frac{2^k}{n!}$, $k \in \mathbb{N}$, then $n + k$ is equal to

- (A) 50 (B) 52 (C) 49 (D) 51

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Q62 Continuity & Differentiability[Step-by-step solution](#) › prepwiser.in/questions/5iot1GG-hp

Let $\alpha, \beta \in \mathbb{R}$ be such that the function $f(x) = \begin{cases} 2\alpha(x^2 - 2) + 2\beta x & , x < 1 \\ (\alpha + 3)x + (\alpha - \beta) & , x \geq 1 \end{cases}$ be differentiable at all $x \in \mathbb{R}$. Then $34(\alpha + \beta)$ is equal to

- (A) 48 (B) 84 (C) 36 (D) 24

Q63 Limits[Step-by-step solution](#) › prepwiser.in/questions/Db7c4YkZSg

If the function $f(x) = \frac{e^x(e^{\tan x - x} - 1) + \log_e(\sec x + \tan x) - x}{\tan x - x}$ is continuous at $x = 0$, then the value of $f(0)$ is equal to

- (A) $\frac{2}{3}$ (B) $\frac{1}{2}$ (C) 2 (D) $\frac{3}{2}$

Q64 Sequences & Series[Step-by-step solution](#) › prepwiser.in/questions/VdNkPZoYfy

Let 729, 81, 9, 1, ... be a sequence and P_n denote the product of the first n terms of this sequence. If $2 \sum_{n=1}^{40} (P_n)^{\frac{1}{n}} = \frac{3^\alpha - 1}{3^\beta}$ and $\gcd(\alpha, \beta) = 1$, then $\alpha + \beta$ is equal to

- (A) 73 (B) 74 (C) 75 (D) 76

Q65 Sequences & Series[Step-by-step solution](#) › prepwiser.in/questions/O9ExOH1hHg

Consider an A.P.: $a_1, a_2, \dots, a_n$; $a_1 > 0$. If $a_2 - a_1 = \frac{-3}{4}$, $a_n = \frac{1}{4}a_1$, and $\sum_{i=1}^n a_i = \frac{525}{2}$, then $\sum_{i=1}^{17} a_i$ is equal to

- (A) 238 (B) 136 (C) 476 (D) 952

Q66 Circles[Step-by-step solution](#) › prepwiser.in/questions/POD68Yt6um

Let a circle of radius 4 pass through the origin O, the points $A(-\sqrt{3}a, 0)$ and $B(0, -\sqrt{2}b)$, where a and b are real parameters and $ab \neq 0$. Then the locus of the centroid of $\triangle OAB$ is a circle of radius

- (A) $\frac{7}{3}$ (B) $\frac{11}{3}$ (C) $\frac{5}{3}$ (D) $\frac{8}{3}$

Q67 Probability: Advanced[Step-by-step solution](#) › prepwiser.in/questions/m9pa_7u2Xq

From a lot containing 10 defective and 90 non-defective bulbs, 8 bulbs are selected one by one with replacement. Then the probability of getting at least 7 defective bulbs is

- (A) $\frac{73}{10^8}$ (B) $\frac{67}{10^8}$ (C) $\frac{7}{10^7}$ (D) $\frac{81}{10^8}$

Q68 Relations & Functions (Basic)[Step-by-step solution](#) › prepwiser.in/questions/7x2zlhDakX

Let R be a relation defined on the set $\{1, 2, 3, 4\} \times \{1, 2, 3, 4\}$ by

$$R = \{((a, b), (c, d)) : 2a + 3b = 3c + 4d\}.$$

Then the number of elements in R is

- (A) 6 (B) 15 (C) 12 (D) 18

Q69 Trigonometric Ratios & Identities[Step-by-step solution](#) › prepwiser.in/questions/toYriDowW-

The value of $\frac{\sqrt{3} \operatorname{cosec} 20^\circ - \sec 20^\circ}{\cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ}$ is equal to

- (A) 32 (B) 64 (C) 12 (D) 16

Q70 Trigonometric Ratios & Identities[Step-by-step solution](#) › [prepwiser.in/questions/jth-YYJEvD](#)

If $\cot x = \frac{5}{12}$ for some $x \in (\pi, \frac{3\pi}{2})$, then $\sin 7x (\cos \frac{13x}{2} + \sin \frac{13x}{2}) + \cos 7x (\cos \frac{13x}{2} - \sin \frac{13x}{2})$ is equal to

(A) $\frac{5}{\sqrt{13}}$

(B) $\frac{6}{\sqrt{26}}$

(C) $\frac{4}{\sqrt{26}}$

(D) $\frac{1}{\sqrt{13}}$

Mathematics Section B · Numerical value

Q71 to Q75

Q71 Applications of Derivatives **NUMERICAL**[Step-by-step solution](#) › [prepwiser.in/questions/3JhEbLq43j](#)

Let $(2\alpha, \alpha)$ be the largest interval in which the function $f(t) = \frac{|t+1|}{t^2}$, $t < 0$, is strictly decreasing. Then the local maximum value of the function $g(x) = 2 \log_e(x-2) + \alpha x^2 + 4x - \alpha$, $x > 2$, is ____

Q72 Matrices **NUMERICAL**[Step-by-step solution](#) › [prepwiser.in/questions/_e9ee-yPzx](#)

The number of 3×2 matrices A, which can be formed using the elements of the set $\{-2, -1, 0, 1, 2\}$ such that the sum of all the diagonal elements of $A^T A$ is 5, is

Q73 Definite Integration **NUMERICAL**[Step-by-step solution](#) › [prepwiser.in/questions/TuH6XU64PI](#)

Let a differentiable function f satisfy the equation $\int_0^{36} f\left(\frac{tx}{36}\right) dt = 4\alpha f(x)$. If $y = f(x)$ is a standard parabola passing through the points $(2, 1)$ and $(-4, \beta)$, then β^α is equal to ____.

Q74 Permutations & Combinations **NUMERICAL**[Step-by-step solution](#) › [prepwiser.in/questions/qLndkv146I](#)

The number of numbers greater than 5000, less than 9000 and divisible by 3, that can be formed using the digits 0, 1, 2, 5, 9, if the repetition of the digits is allowed, is ____

Q75 Three Dimensional Geometry **NUMERICAL**[Step-by-step solution](#) › [prepwiser.in/questions/mZ3EOd3rOp](#)

Let a line L passing through the point $P(1, 1, 1)$ be perpendicular to the lines $\frac{x-4}{4} = \frac{y-1}{1} = \frac{z-1}{1}$ and $\frac{x-17}{1} = \frac{y-71}{1} = \frac{z}{0}$. Let the line L intersect the yz -plane at the point Q. Another line parallel to L and passing through the point $S(1, 0, -1)$ intersects the yz -plane at the point R. Then the square of the area of the parallelogram PQRS is equal to ____.

Answer key: JEE Main 2026 · 24 Jan · Shift 1

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Physics

1.	C	2.	C	3.	B	4.	D	5.	D	6.	A	7.	C	8.	D
9.	A	10.	D	11.	C	12.	C	13.	A	14.	D	15.	A	16.	D
17.	A	18.	B	19.	C	20.	A	21.	125	22.	3730	23.	210	24.	64
25.	160														

Chemistry

26.	A	27.	D	28.	C	29.	D	30.	C	31.	B	32.	D	33.	D
34.	A	35.	B	36.	C	37.	C	38.	A	39.	D	40.	C	41.	B
42.	A	43.	C	44.	B	45.	C	46.	4	47.	54	48.	15	49.	111
50.	12														

Mathematics

51.	C	52.	D	53.	C	54.	D	55.	A	56.	A	57.	A	58.	A
59.	B	60.	B	61.	C	62.	A	63.	D	64.	A	65.	A	66.	D
67.	A	68.	C	69.	B	70.	D	71.	4	72.	312	73.	64	74.	42
75.	6														

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