

JEE MAIN 2026 – Memory-Based Questions and Answers

Session 1 | Date: 23 January 2026

Shift: 2

Duration: 3 Hours

Maximum Marks: 300

Note: This paper is prepared based on students' memory and post-exam discussions. Questions may not be exact replicas of the actual exam and are meant only for practice and analysis.

PHYSICS

Section A – MCQs

1. A particle moves in a straight line with velocity $v = 3t^2 - 2t$. Find the total distance travelled between $t = 0$ s and $t = 3$ s.
2. Two identical conducting spheres of radius R carrying charges $+Q$ and $+4Q$ are brought in contact and separated. Find the ratio of their final potentials.
3. A ray of light is incident at an angle of 30° on a glass slab of refractive index 1.5. Find the angle of refraction.
4. A uniform rod of length L is hinged at one end and released from rest in a horizontal position. Find the angular speed of the rod when it makes an angle of 60° with the horizontal.
5. A capacitor is charged using a battery and then disconnected. It is then connected to another uncharged capacitor. Find the ratio of energies before and after connection.
6. The stopping potential for a metal surface is found to be 3 V. Find the maximum kinetic energy of the emitted photoelectrons.
7. A wire of resistance R is stretched uniformly so that its length becomes twice the original length. Find the new resistance.
8. A block is placed on a rough inclined plane. The coefficient of friction is μ . Find the condition for the block to just start sliding.

- Find the de Broglie wavelength of an electron accelerated through a potential difference V .
 - A diatomic gas undergoes an adiabatic expansion. Which of the following quantities remains constant?
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Section B – Numerical Value Questions

- Find the rms speed of nitrogen molecules at 300 K.
 - A potentiometer wire is 100 cm long and has a potential gradient of 5 mV/cm. Find the emf of the cell if the null point is at 60 cm.
 - Find the magnetic field at the center of a circular coil of radius r carrying current I .
 - A particle performs SHM with angular frequency 100 rad/s and amplitude 0.1 m. Find the maximum acceleration.
 - Find the work done by a force $F = 5x$ in moving a particle from $x = 0$ to $x = 2$ m.
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CHEMISTRY

Section A – MCQs

- Which of the following elements has the highest first ionization enthalpy?
- Arrange the following species in increasing order of atomic radius:
 $O^{2-}, F^-, Na^+, Mg^{2+}, O^{2-}, F^-, Na^+, Mg^{2+}$
- Which of the following is an example of a coordination compound?
- Identify the correct hybridization of the central atom in SF_6 .
- Which of the following aldehydes will undergo Cannizzaro reaction?
- Identify the correct IUPAC name of the given organic compound.

7. Which of the following statements is correct regarding intermolecular hydrogen bonding?
 8. What is the oxidation state of chromium in $K_2Cr_2O_7$?
 9. Which of the following solutions acts as a buffer?
 10. Identify the incorrect statement related to periodic trends.
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Section B – Numerical Value Questions

11. Calculate the pH of a 0.01 M HCl solution.
 12. Find the number of moles of oxygen present in 16 g of O_2 .
 13. Calculate the molarity of a solution containing 5 g of NaOH dissolved in 250 mL of solution.
 14. Calculate the percentage of nitrogen in urea $(NH_2)_2CO$.
 15. Calculate the equilibrium constant for the given reaction at a specified temperature.
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MATHEMATICS

Section A – MCQs

1. Find the derivative of $y = x^x$.
2. Solve the equation $|2x-3|=5$.
3. If the roots of the quadratic equation $x^2-7x+10=0$ are α and β , find $\alpha+\beta$.
4. Find the domain of the function $f(x)=\ln(3x-1)$.
5. Find the equation of the line passing through (2, 3) and perpendicular to the line $3x-4y+5=0$.

6. Evaluate the definite integral $\int_0^1 (3x^2 + 2x) dx$
 7. Find the sum of the first 10 terms of an arithmetic progression with first term 2 and common difference 3.
 8. If the determinant of a matrix is zero, what can be concluded about the matrix?
 9. Find the maximum value of $\sin x + \cos x$.
 10. Find the locus of a point which moves such that its distance from a fixed point is constant.
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Section B – Numerical Value Questions

11. Evaluate

$$\int_0^2 x e^{x^2} dx$$

12. Find the area of the region bounded by the curve $y = x^2$ and the x-axis between $x = 0$ and $x = 2$.
13. Find the value of n if the sum of the first n natural numbers is 210.
14. Solve the differential equation

$$\frac{dy}{dx} = 3x^2$$

15. Find the distance between the points (1, 2, 3) and (4, 6, 8).