

JEE Main 2025 Jan 24 Shift 1 Question Paper

Time Allowed :3 Hours	Maximum Marks :300	Total Questions :75
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1. Which of the following statements about carbocation stability and aldol reactions is correct?

- (1) A primary carbocation is more stable than a tertiary carbocation.
 - (2) In an aldol reaction, a base abstracts a proton from the α -carbon, leading to an enolate ion.
 - (3) The stability of carbocations decreases with resonance stabilization.
 - (4) Aldol condensation occurs without the formation of an enolate ion.
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2. A spring has tension 5N at x_1 extension and 7N at x_2 extension. Determine the tension in the spring when the extension is $5x_1 - 2x_2$.

- (1) 11 N
 - (2) 39 N
 - (3) 25 N
 - (4) 12 N
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3. Which of the following is the strongest oxidizing agent?

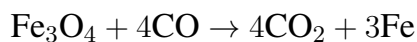
- (a) Eu^{2+}
 - (b) Ce^{2+}
 - (c) Ce^{4+}
 - (d) Eu^{4+}
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4. The difference in melting point (M.P.) and boiling point (B.P.) between oxygen and sulfur can be explained by:

- (a) EN (Electronegativity)
- (b) ΔNeg (Electron affinity)

- (c) Atomicity
(d) IE (Ionization Energy)
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5. If 10 mol of CO and 10 mol of Fe_3O_4 react according to the equation:



What is the weight of Fe produced?

6. A body is projected with an initial velocity v_0 at a 45° angle in the $X - Y$ plane. What is the angular momentum at the highest point?

7. Compare the dipole moment of the following molecules: NH_3 , H_2O , CH_4

8. A solid cylinder is rolling on an inclined plane at an angle θ . What is its linear acceleration?

9. A wire of resistance 9 ohm is bent into the shape of an equilateral triangle. What is the equivalent resistance between any two vertices of the triangle?

10. A big spherical drop breaks down into 27 smaller droplets. The work done to break it is 10 J. If the same drop breaks into 64 droplets of the same radius, find the work done.
