



General Instructions

- (i) **Duration:** The total duration of the examination is 3 hours (180 minutes).
- (ii) **Total Marks:** The complete paper carries a maximum of 200 marks.
- (iii) **Structure:** The paper has 3 Sections:
 - **Section A:** 50 Multiple Choice Questions (Physics).
 - **Section B:** 50 Multiple Choice Questions (Chemistry).
 - **Section B:** 50 Multiple Choice Questions (Mathematics).
- (iv) **Compulsory Questions:** All 150 questions are compulsory.
- (v) Each question has four options. Only **one** option is correct.
- (vi) **Correct Answer:** +1 marks.
- (vii) **Incorrect Answer:** (No Negative marking).
- (viii) **Unanswered/Marked for Review:** 0 marks.

1. For a first-order reaction, the time required to reduce the concentration of the reactant to half its initial value is:

- (A) $0.3010/k$
- (B) $1/k$
- (C) $0.693/k$
- (D) $2.303/k$

2. The EAN of cobalt in the complex $[\text{Co}(\text{NH}_3)_6]^{3+}$ is:

- (A) 27
 - (B) 30
 - (C) 33
 - (D) 36
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3. A cube of edge 4 cm has mass 256 g. The density of the material in SI unit is:

- (A) 4 kg/m^3
 - (B) 1600 kg/m^3
 - (C) 4000 kg/m^3
 - (D) 1000 kg/m^3
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4. The Van't Hoff factor for a solution of K_2SO_4 in water is:

- (A) 1
 - (B) 2
 - (C) 3
 - (D) 4
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5. In the electrolysis of molten NaCl, the product obtained at the cathode is:

- (A) Cl gas
 - (B) Na metal
 - (C) NaOH
 - (D) H gas
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6. Which of the following is an example of physisorption?

- (A) Adsorption of NH_3 on charcoal
 - (B) Adsorption of H on Ni
 - (C) Adsorption of noble gases on solid surface
 - (D) Adsorption of O on heated metal
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7. Which of the following reagents are used in Friedel–Crafts alkylation?

- (A) AlCl_3
 - (B) FeCl_3
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(C) RCOCl

(D) H_2SO_4
