

JEE (Main) – Chemistry Sample Question Paper

Subject	Chemistry
Total Number of Questions	25
Maximum Marks	100
Time Allowed	60 Minutes

Marking Scheme (As per JEE Main Pattern)

Each question carries **4 (four) marks**.

1 (one) mark will be deducted for each incorrect answer.

No marks will be deducted for unattempted questions.

Only one option is correct for each question.

Important Instructions

1. This Question Paper consists of **25 Multiple Choice Questions** from **Chemistry** only.
2. All questions are compulsory.
3. Rough work should be done only in the space provided in the Question Paper.
4. Calculators, mobile phones, smart watches, or any electronic devices are strictly prohibited.

Name of the Candidate (Capital Letters)	
Roll Number	
Examination Centre Name	
Candidate's Signature	Date

Invigilator's Signature

CHEMISTRY

1. Decreasing order of the hydrogen bonding in following forms of water is correctly represented by

- A. Liquid water
- B. Ice
- C. Impure water

Choose the correct answer from the options given below:

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

2. The magnetic moment of a transition metal compound has been calculated to be 3.87 B.M. The metal ion is

- A) T_1^{2+}
- B) Mn^{2+}
- C) V^{2+}
- D) Cr^{2+}

3. Match List I with List II

List I (Complex) List II (Hybridization)

- | | | |
|------------------------|------|-----------|
| A. $Ni(CO)_4$ | I. | sp^3 |
| B. $[Cu(NH_3)_4]^{2+}$ | II. | dsp^2 |
| C. $[Fe(NH_3)_6]^{2+}$ | III. | sp^3d^2 |
| D. $[Fe(H_2O)_6]^{2+}$ | IV. | d^2sp^3 |

Choose the correct answer from the options given below:

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

4. The primary and secondary valencies of cobalt respectively in $[Co(NH_3)_5Cl]Cl_2$ are :

- A) 3 and 5
- B) 2 and 6
- C) 2 and 8
- D) 3 and 6

5. The wave function (Ψ) of $2s$ is given by $\Psi_{2s} = \frac{1}{2\sqrt{2\pi}} \left(\frac{1}{a_0}\right)^{1/2} \left(2 - \frac{r}{a_0}\right) e^{-\frac{r}{2a_0}}$ At $r = r_0$, radial node is formed

Thus, r_0 in terms of a_0

- A) $r_0 = \frac{a_0}{2}$
- B) $r_0 = 2a_0$
- C) $r_0 = 4a_0$
- D) $r_0 = a_0$

6. Freezing point of solution is less than that of pure solvent, which of the following statements are correct ?

- (A) Vapour pressure of solution is less than that of pure solvent
- (B) Vapour pressure of solution is greater than that of pure solvent
- (C) Only solvent molecules will freeze
- (D) Only solute molecules will freeze

- A) A & B only
- B) A & C only
- C) C & D only
- D) A, B & D only

16. Caprolactam when heated at high temperature in presence of water, gives
 A) Dacron
 B) Nylon 6
 C) Teflon
 D) Nylon 6, 6
17. How many reactions are non-spontaneous at 300 K. For independent reaction ΔH & ΔS values are given.
 A) $\Delta H = -25\text{kJ/mol}$, $\Delta S = -80\text{J/mol}$
 B) $\Delta H = +25\text{kJ/mol}$, $\Delta S = -50\text{J/mol}$
 C) $\Delta H = -22\text{kJ/mol}$, $\Delta S = +50\text{J/mol}$
 D) $\Delta H = -22\text{kJ/mol}$, $\Delta S = 80\text{J/mol}$
18. Match List -I with List-II

LIST-I (Atomic number) LIST-II (Block of periodic table)

(A) 37 (K)	I. p-block
(B) 78 (Pt)	II. d-block
(C) 52 (Te)	III. f-block
(D) 65 (Tb)	IV. s-block

Choose the correct answer from the options given below:

- A) A - IV, B - II, C - I, D - III
 B) A - IV, B - III, C - II, D - I
 C) A - I, B - III, C - IV, D - II
 D) A - II, B - IV, C - I, D - III
19. The normal rain water is slightly acidic and its pH value is 5.6 because of which one of the following ?
 A) $CO_2 + H_2O \rightarrow H_2CO_3$
 B) $N_2O_5 + H_2O \rightarrow 2HNO_3$
 C) $2SO_2 + O_2 + 2H_2O \rightarrow 2H_2SO_4$
 D) $4NO_2 + O_2 + 2H_2O \rightarrow 4HNO_3$
20. Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R)
 Assertion (A) : An aqueous solution of KOH when used for volumetric analysis, its concentration should be checked before the use
 Reason (R) : On aging, KOH solution absorbs atmospheric CO_2
 In the light of the above statements, choose the correct answer from the options given below :
 A) (A) is correct but (R) is not correct
 B) (A) is not correct but (R) is correct
 C) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
 D) Both (A) and (R) are correct and (R) is the correct explanation of (A)
21. It is observed that characteristic X -ray spectra of elements show regularity. When frequency to the power " n " i.e. ν^n of X -rays emitted is plotted against atomic number " Z ", following graph is obtained
- A) 2
 B) 3
 C) 1
 D) $\frac{1}{2}$
22. Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R)
Assertion (A): In expensive scientific instruments, silica gel is kept in watch-glasses or in semipermeable membrane bags
Reason (R): Silica gel adsorbs moisture from air via adsorption, thus protects the instrument from water corrosion (rusting) and / or prevents malfunctioning
 In the light of the above statements, choose the correct answer from the options given below :
 A) Both (A) and (R) are true and (R) is the correct explanation of (A)
 B) Both (A) and (R) are true but (R) is not the correct explanation of (A)
 C) (A) is false but (R) is true
 D) (A) is true but (R) is false

JEE MAIN CHEMISTRY ANSWER KEY

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