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. Anomalous behaviour of oxygen is due to its

A) Large size and high electronegativity

B) Small size and low electronegativity

C) Small size and high electronegativity

D) Large size and low electronegativity

2. The energy of an electron in the first Bohr orbit of hydrogen atom is $-2.18 \times 10^{-18} J$. Its energy in the third Bohr orbit is ____.

A) One third of this value

B) $\frac{1}{9}$ th of this value

C) Three times of this value

D) $\frac{1}{27}$ of this value

3. The element having the highest first ionization enthalpy is

A) Si

B) Al

C) N

D) C

4. $2IO_3^- + xI^- + 12H^+ \longrightarrow 6I_2 + 6H_2O$ What is the value of x?

A) 2

B) 10

C) 6

D) 12

5. The density of the alkali metals is in the order:

A) K<Na<Rb<Cs

B) Na<K<Cs<Rb

C) K<Cs<Na<Rb

D) NavRb<K<Cs

6. The correct order of spin only magnetic moments for the following complex ions is

A) $[Fe(CN)_6]^{3-} < [CoF6]^{3-} < [MnBr_4]^{2-} < [Mn(CN)_6]^{3-}$

B) $[Fe(CN)_6]^{3-} < [Mn(CN)_6]^{3-} < CoF_6]^{3-} < [MnBr_4]^{2-}$

C) $[COF_6]^{3-} < [MnBr_4]^{2-} < [Fe(CN)_6]^{3-} < [Mn(CN)_6]^{3-}$

D) $[MnBr_4]^{2-} < [CoF_6]^{3-} < [Fe(CN)_6]^{3-} < [Mn(CN)_6]^{3-}$

7. We have three aqueous solutions of NaCl labelled as 'A', 'B' and 'C' with concentration 0.1 M, 0.01M & 0.001 M, respectively. The value of vant' Haft factor (i) for these solutions will be in the order.

A) $i_A < i_B < i_C$

B) $i_A < i_C < i_B$

C) $i_A = i_B = i_C$

D) $i_A > i_B > i_C$

8. Which of the following acts as a strong reducing agent? (Atomic number : Ce = 58, Eu = 63, Gd = 64, Lu = 71)

A) Lu^{3+}

B) Gd^{3+}

C) Eu^{2+}

D) Ce^{4+}

9. In chromyl chloride, the number of d-electrons present on chromium is same as in (Given at no. of Ti : 22, V : 23, Cr : 24, Mn : 25, Fe : 26)

A) Mn (VII)

B) Fe (III)

C) V (IV)

D) Ti (III)

10. Choose the correct option having all the elements with d^{10} electronic configuration from the following:

A) $^{27}Co, ^{28}Ni, ^{26}Fe, ^{24}Cr$

B) $^{29}Cu, ^{30}Zn, ^{48}Cd, ^{47}Ag$

C) $^{46}Pd, ^{28}Ni, ^{26}Fe, ^{24}Cr$

D) $^{28}Ni, ^{24}Cr, ^{26}Fe, ^{29}Cu$

11. The coordination geometry around the manganese in decacarbonyldimanganese(0) is

A) Octahedral

B) Trigonal bipyramidal

C) Square pyramidal

D) Square planar

12. Given below are two statements:
Statement (I): Aqueous solution of ammonium carbonate is basic.
Statement (II): Acidic/basic nature of salt solution of a salt of weak acid and weak base depends on K_a and K_b value of acid and the base forming it.
In the light of the above statements, choose the most appropriate answer from the options given below:

A) Both Statement I and Statement II are correct

B) Statement I is correct but Statement II is incorrect

C) Both Statement I and Statement II are incorrect

D) Statement I is incorrect but Statement II is correct

13. The compound that is white in color is

A) ammonium sulphide

B) lead sulphate

C) lead iodide

D) ammonium arsinomolybdate

14. Given below are two statements:
Statement (I): The 4f and 5f-series of elements are placed separately in the Periodic table to preserve the principle of classification.
Statement (II): s-block elements can be found in pure form in nature.
In the light of the above statements, choose the most appropriate 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) Statement I is true but Statement II is false

D) Both Statement I and Statement II are false

15. The Lassaigne's extract is boiled with dil HNO_3 before testing for halogens because

A) AgCN is soluble in HNO_3

B) Silver halides are soluble in HNO_3

C) Ag_2S is soluble in HNO_3

D) Na_2S and NaCN are decomposed by HNO_3

16. The correct sequence of electron gain enthalpy of the elements listed below is
A. Ar
B. Br
C. F
D. S
Choose the most appropriate from the options given below:

A) C > B > D > A

B) A > D > B > C

C) A > B > D > C

D) D > C > B > A

17. The group of chemicals used as pesticide is

A) Dieldrin, Sodium arsinite, Tetrachloroethene

B) Sodium chlorate, DDT, PAN

C) DDT, Aldrin

D) Aldrin, Sodium chlorate, Sodium arsinite

18. Given below are two statements:
Statement (I) : Oxygen being the first member of group 16 exhibits only –2 oxidation state.
Statement (II) : Down the group 16 stability of +4 oxidation state decreases and +6 oxidation state increases.
In the light of the above statements, choose the most appropriate answer from the options given below:

A) Statement I is correct but Statement II is incorrect

B) Both Statement I and Statement II are correct

C) Both Statement I and Statement II are incorrect

D) Statement I is incorrect but Statement II is correct

19. Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R:
Assertion (A): B_eCl_2 and $MgCl_2$ produce characteristic flame.

Reason (R) : The excitation energy is high in B_eCl_2 and $MgCl_2$

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

A) Both (A) and (R) are true but (R) is NOT the correct explanation of (A)

B) (A) is false but (R) is true

C) Both (A) and (R) are true and (R) is the correct explanation of (A)

D) (A) is true but (R) is false.

20. The complex with highest magnitude of crystal field splitting energy (Δ0) is

A) $[Ti(OH)_2)_6]^{3+}$

B) $[C_r(OH)_2)_6]^{3+}$

C) $[m_n(OH)_2)_6]^{3+}$

D) $[F_e(OH)_2)_6]^{3+}$

21. NaCl reacts with conc. H_2SO_4 and $K_2Cr_2O_7$ to give reddish fumes (B), which react with NaOH to give yellow solution (C). (B) and (C) respectively are:

A) CrO_2Cl_2, Na_2CrO_4

B) Na_2CrO_4, CrO_2Cl_2

C) $CrO_2Cl_2, KHSO_4$

D) $CrO_2Cl_2, Na_2Cr_2O_7$

22. Given below are two statements:
Statement (I): A solution of $[Ni(H_2O)_6]^{2+}$ is green in color.
Statement (II): A solution of $[Ni(CN)_4]^{2-}$ is colorless.
In the light of the above statements, choose the most appropriate answer from the options given below.

A) Both Statement I and Statement II are incorrect

B) Both Statement I and Statement II are correct

C) Statement I is incorrect but Statement II is correct

D) Statement I is correct but Statement II is incorrect

23. Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).
Assertion (A) : PH_3 has lower boiling point than NH_3.

Reason (R) : In liquid state NH_3 molecules are associated through vander waal's forces, but PH_3 molecules are associated through hydrogen bonding.
In the light of the above statements.
Choose the most appropriate answer from the options given below:

A) Both (A) and (R) are correct and (R) is not the correct explanation of (A)

B) (A) is not correct but (R) is correct

C) Both (A) and (R) are correct but (R) is the correct explanation of (A)

D) (A) is correct but (R) is not correct

24. Which of the following statements is not correct about rusting of iron?

A) Coating of iron surface by tin prevents rusting, even if the tin coating is peeling off.

B) When pH lies above 9 or 10, rusting of iron does not take place.

C) Dissolved acidic oxides SO_2, NO_2

D) Rusting of iron is envisaged as setting up of electrochemical cell on the surface of iron object.

25. Given below are two statements :
Statement I: Boron is extremely hard indicating its high lattice energy
Statement II: Boron has highest melting and boiling point compared to its other group members.
In the light of the above statements, choose the most appropriate answer from the options given below :

A) Both Statement I and Statement II is correct

B) Both Statement I and Statement II is incorrect

C) Statement I is correct but Statement II is incorrect

D) Statement I is incorrect but Statement II is correct

JEE MAIN CHEMISTRY ANSWER KEY

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