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. $Be(OH)_2$ reacts with $Sr(OH)_2$ to yield an ionic salt. Choose the incorrect option related to this reaction from the following:

A) Both Sr and Be elements are present in the ionic salt.

B) The reaction is an example of acid - base neutralization reaction.

C) The element Be is present in the cationic part of the ionic salt.

D) Be is tetrahedrally coordinated in the ionic salt.

2. The linear combination of atomic orbitals to form molecular orbitals takes place only when the combining atomic orbitals

A. have the same energy
B. have the minimum overlap
C. have same symmetry about the molecular axis
D. have different symmetry about the molecular axis.

Choose the most appropriate from the options given below:

A) A, B, C only

B) A and C only

C) B and C only

D) B and D only

3. Given below are two statements: One is labelled as "Assertion A" and the other is labelled as "Reason R".

Assertion A: In the complex Ni(CO), and Fe(CO)s, the metals have zero oxidation state.

Reason R: Low oxidation states are found when a complex has ligands capable of π-donor character in addition to the o-bonding.

In the light of the above statements, choose the most appropriate answer from the option given below.

A) Both A and R are correct and R is the correct explanation of A.

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

C) A is correct but R is not correct

D) A is not correct but R is correct

4. The metals that are employed in the battery industries are

A. Fe
B. Mn
C. Ni
D. Cr
E. Cd

Choose the correct answer from the options given below:

A) B, C, and E only

B) A, B, C, D, and E

C) A, B, C, and D only

D) B, D, and E only

5. 2-Methyl propyl bromide reacts with $C_2H_5O^-$ and gives 'A' whereas on reaction with C_2H_5OH it gives 'B'. The mechanism followed in these reactions and the products 'A' and 'B' respectively are

A) S_N2. A iso-butyl ethyl ether; S_N1, B = tert- butyl ethyl ether

B) S_N1, A tert-butyl ethyl ether; S_N2, B = iso- butyl ethyl ether

C) S_N1, A = tert-butyl ethyl ether; S_N1, B = 2- butyl ethyl ether

D) S_N2, A = 2-butyl ethyl ether; S_N2, B = iso- butyl ethyl ether

6. Match List I with List II

LIST-I		LIST-II
A. Glucose/$NaHCO_3/\Delta$		I. Gluconic acid
B. Glucose/HNO_3		II. No reaction
C. Glucose/HI/Δ		III. n-hexane
D. Glucose/Bromine water		IV. Saccharic acid

Choose the correct answer from the options given below:

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

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

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

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

7. Identify correct statements from below:

A. The chromate ion is square planar.

B. Dichromates are generally prepared from chromates.

C. The green manganate ion is diamagnetic.

D. Dark green coloured $K_2\,MnO_4$ disproportionates in a neutral or acidic medium to give permanganate.

E. With increasing oxidation number of transition metal, ionic character of the oxides decreases.

Choose the correct answer from the options given below:

A) B, C, D only

B) A, D, E only

C) A, B, C only

D) B, D, E only

8. The correct IUPAC name of K_2MnO_4 is

A) Potassium tetraoxopermanganate (VI)

B) Potassium tetraoxidomanganate (VI)

C) Dipotassium tetraoxidomanganate (VII)

D) Potassium tetraoxidomanganese (VI)

9. 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

10. The bond order and magnetic property of acetylide ion are same as that of

A) O_2^+

B) N_2^+

C) NO^+

D) O_2^-

11. 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)

12. The compound that is white in color is

A) ammonium sulphide

B) lead sulphate

C) lead iodide

D) ammonium arsinomolybdate

13. 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

14. In case of isoelectronic species the size of F^- , Ne and Na^+ is affected by:

A) Principal quantum number (n)

B) None of the factors because their size is the same

C) Electron-electron interaction in the outer orbitals

D) Nuclear charge (z)

15. 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

16. Given below are two statements:
One is labelled as Assertion A and the other is labelled as Reason R:
Assertion A: Alcohols react both as nucleophiles and electrophiles.
Reason R: Alcohols react with active metals such as sodium, potassium and aluminum to yield corresponding alkoxides and liberate hydrogen.
In the light of the above statements, choose the correct answer from the options given below:

A) A is false but R is true.

B) A is true but R is false.

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

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

17. 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) $i_A > i_B > i_C$

18. 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

19. The correct statement regarding nucleophilic substitution reaction in a chiral alkyl halide is:

A) Retention occurs in SN_1 reaction and inversion occurs in SN_2 reaction.

B) Racemisation occurs in SN_1 reaction and retention occurs in SN_2 reaction.

C) Racemisation occurs in both SN_1 and SN_2 reactions.

D) Racemisation occurs in S_N1 reaction and inversion occurs in S_N2 reaction.

20. On passing a gas, 'X', through Nessler's reagent, a brown precipitate is obtained. The gas 'X' is

A) H_2S

B) CO_2

C) NH_3

D) Cl_2

21. Given below are two statements :
Statement-I: Morphine is a narcotic analgesis. It helps in relieving pain without producing sleep.
Statement-II: Morphine and its derivatives are obtained from opium poppy.
In the light of the above statements, choose the correct answer from the options given below.

A) Both Statement I and Statement II are true

B) Both Statement I and Statement II are false

C) Statement I is true but Statement II is false

D) Statement I is false but Statement II is true

22. ClF5 at room temperature is:

A) Colourless liquid with trigonal bipyramidal geometry.

B) Colourless liquid with square pyramidal geometry

C) Colourless gas with square pyramidal geometry

D) Colourless gas with trigonal bipyramidal geometry.

23. The correct statements from following are:

A. The strength of anionic ligands can be explained by crystal field theory.

B. Valence bond theory does not give a quantitative interpretation of kinetic stability of coordination compounds.

C. The hybridization involved in formation of $[Ni(CN)_4]^{2-}$ complex is dsp^2.

D. The number of possible isomer(s) of $cis-[PtCl_2(en)_2]^{2+}$ is one.

Choose the correct answer from the options given below:

A) A, D only

B) A, C only

C) B, D only

D) B, C only

24. Given below are two statements :

Statement I: SbCI, is more covalent than SbCI3

Statement II: The higher oxides of halogens also tend to be more stable than the lower ones.

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) Both statement I and Statement II are incorrect

C) Statement I is correct but Statement II is incorrect

D) Statement I is incorrect but Statement II is correct

25. The product , which is not obtained during the electrolysis of brine solution is ____ .

A) cl_2

B) H_2

C) HCl

D) N_aOH

JEE MAIN CHEMISTRY ANSWER KEY

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