

TUSHAR

ST. GEORGE'S SCHOOL, ALAKNANDA
MID TERM EXAMINATION (2016-2017)
SUBJECT: CHEMISTRY
CLASS - XII

DATE: 28.9.16.
TIME: 3 HRS.

MAX MARKS: 70
NO. OF PAGES: 3

GENERAL INSTRUCTIONS

- (i) Attempt all questions.
- (ii) Question No. 1 to 5 are very short answer questions and carry 1 mark each. They are to be answered in one word or one sentence each.
- (iii) Question No. 6 to 10 are short answer questions and carry 2 marks each. They are to be answered in about 30 words each.
- (iv) Question No. 11 to 22 are long answer questions and carry 3 marks each. They are to be answered in about 50 words each.
- (v) Question No. 23 is a value based questions and carry 4 mark.
- (vi) Question No. 24 to 26 are long answer questions and carry 5 marks each. They are to be answered in about 70 words each.

- Q1. State first law of Faraday.. 1
- Q2. Name the process that is used to enrich sulphide ores. 1
- Q3. Write the IUPAC nomenclature of the compound $K_4[Fe(CN)_6]$. 1
- Q4. Why is electron gain enthalpy of Cl_2 more than F_2 ? 1
- Q5. Glass is called a super cooled liquid. Why? 1
- Q6. Silver crystallizes in fcc lattice. If edge length of the unit cell is 4.07×10^{-8} cm and the density is 10.5 g/cm^3 , calculate the atomic mass of silver. (given: $N_A = 6.023 \times 10^{23}$) 2
- Q7. Define the following terms: 2
- (a) Half life (b) Effective collisions
- Q8. Draw the structures of the following molecules: 2
- (a) PCl_5 (b) XeF_6
- Q9. How is chemical reduction different from electrolytic reduction? Name a metal each which is obtained by each of these process. 2
- Q10. Write two points of difference between physical adsorption and chemisorption. 2
- Q11. Write one point of difference between the following: 3
- (a) Frenkel and Schottky defect.
(b) Schottky and vacancy defect.
(c) Frenkel and interstitial defect.
- Q12. State Kohlrausch law of independent migration of ions. Calculate λ_m° for $CaCl_2$ and $MgSO_4$ from the following data:
- λ_m° for $Ca^{2+} = 119.0 \text{ S cm}^2 \text{ mol}^{-1}$
 λ_m° for $Cl^{-} = 76.3 \text{ S cm}^2 \text{ mol}^{-1}$

$$\lambda_m^\circ \text{ for } \text{Mg}^{2+} = 106 \text{ S cm}^2 \text{ mol}^{-1}$$

$$\lambda_m^\circ \text{ for } \text{SO}_4^{2-} = 160.0 \text{ S cm}^2 \text{ mol}^{-1}$$

3

Q13. (a) What do you understand by the term colligative properties.

(b) Why is the freezing point depression of 0.1M sodium chloride solution nearly twice that of 0.1M glucose solution.

3

Q14. Define activation energy. The rate of reaction of a particular reaction doubles when temperature changes from 27°C to 37°C. Calculate energy of activation for the reaction.

(given: $R = 8.314 \text{ J/K/mole}$)

3

Q15. Explain what is observed when

(i) An electric current is passed through a sol.

(ii) A beam of light is passed through a sol.

(iii) an electrolyte is added to ferric hydroxide sol.

3

Q16. Write short notes on:

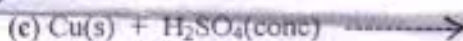
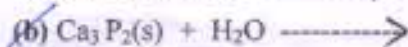
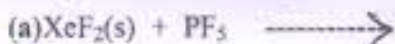
(a) Magnetic separation

(b) Liquation

(c) Distillation

3

Q17. Complete the following:



3

Q18. How potassium dichromate is prepared from chromite ore? Write all steps with chemical equations?

3

Q19. Define geometrical isomerism. Draw the geometrical isomers of the compound having formula $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$.

3

Q20. The spin only magnetic moment of $[\text{MnBr}_4]^{2-}$ is 5.9 BM. Predict the geometry of the complex ion.

3

Q21. Explain the following terms:

(a) Dialysis

(b) Brownian movement

(c) Peptisation

3

Q22. (a) What is the no. of unpaired electron in $[\text{CoF}_6]^{3-}$ and $[\text{Co}(\text{NH}_3)_6]^{3+}$.

(b) With the help of a diagram explain the crystal field splitting in octahedral complex.

3

Q23. Shanti, a domestic helper of Mrs. Anuradha, fainted while mopping the floor. Anuradha immediately took her to nearby hospital where she was diagnosed to be severely anaemic. The doctor prescribed an iron rich diet and multivitamins. After a month, Shanti was normal. After reading this paragraph, answer the following questions.

(a) What values are shown by Anuradha.

(b) Name the vitamin whose deficiency causes pernicious anaemia.

(C) Give an example of water soluble vitamin.

4

Q24. (a) Write two differences between ideal and non ideal solutions

(b) When 30 ml of ethanol and 30 ml of water are mixed, the volume of resulting solution is more than 60 ml. Why?

(c) Define two types of azeotropes.

5

Q25. Give reasons for the following:

(a) Nitrogen exists as gas whereas phosphorus exists as solid?

(b) HF is the weakest acid among hydrohalic acids in spite of the fact that fluorine is most electronegative.

(c) There is a large difference in the boiling points of oxygen and sulphur.

(d) Sulphur vapour exhibits some paramagnetic behaviour.

(e) Acidic character of hydrides of group 16 increases down the group.

5

Q26

(a) What is the main cause of lanthanoid contraction?

(b) Write consequences of lanthanoid contraction

(c) The outer electronic configuration of atoms of two members of lanthanoid series is given below:

(i) $4f^0 5d^1 6s^2$

(ii) $4f^0 5d^0 6s^2$

Find their atomic numbers. What oxidation state will possibly be exhibited by these elements?

5