S S ALAM SUGGESTION PAPER FOR 2017

CHEMISTRY

EXAM DATE-25th MARCH 2017

1 MARKS QUESTIONS

1. What is called sorption ?

2. Write the IUPAC structure of the following compound .

   2-Bromo-3-oxopentanoic acid

3. Chlorine has bleaching property.Explain.

4. Which aliphatic aldehyde will not respond to Iodoform test ?

5. Arrange the basicity of the following amines in increasing order :

   CH3NH2 , (CH3) 2NH and (CH3)3N (in aqueous solution)

6. Define Pseudo first order reaction with example?

7. What do you meant by state selective catalysis?

8. Draw the shape of BrF3 ?

9. Write the IUPAC name of the compound $[Co(NH)3(ONO)]\ 2_{+}$

10. Write the formula and chemical name of DDT.

11. Convert propene to acetone?

12. Explain HVZ reaction?

13. Distinguish between Propanol and Propanone?

14. Arrange the following types of interactions in correct order of their increasing strength :

    Covalent, hydrogen bonding, Vander Waals, dipole dipole

15. Give reasons :

    (a) Window glass of old building look milky.

    (b) Window glass of old building is thick at bottom

16. Define activation energy.

17. Name two important use of formaline?

18. Enumerate two reactions of glucose which cannot be explained by its open chain structure.

19. Out of C and CO , which is better reducing agent at 673 K ?

20. What is the IUPAC name of K[Co(CO)4] ?

21. Why haloarene are less reactive than haloalkane towards nucleophilic substitution reaction ?

22. Explain Riemer tieman reaction?

23. (a) Sketch the Zwitter Ion form of amino acetic acid .

(b) The rate constant of a reaction is 2 X 10-2 Lmol-1 sec-1 .What is the order of the reaction ?

24. (a) The conversion of molecule X and Y follows second order Kinetics . If the concentration of X is increased to three times, how will it affect the rate of formation of Y.

(b) Write the IUPAC name of the following organic compounds:

(a) CH3NHCH(CH3)2 (b) [Co(NH3)5(ONO)]+2

25. Write the mechanism of acid dehydration of Ethanol to yield ethene.

26. (1) Define Harery law with two application ?

(2) What is the value of Vant HOFF factor for dilute solution of K2 SO4 in water?

2 MARKS QUESTIONS

1. (a) Distinguish between physiosorption and chemisorptions.

(b) How does chemisorption vary with temperature?(Write graphical representation.)

2. An element crystallizes in a structure having a FCC unit cell of an edge of 200 pm. Calculate its Density if 200 gm of this element contain 24 x 10 23 atoms.

3. Write short notes on the following :

a) Broad spectrum antibiotics ,

b) Antihistamines .

4. (a) Distinguish between Frenkel and Schottky defect .

(b) What is called doping? How is it created?

5. Write short notes on :

(a) Swarts reaction ,

(b) Chirality .

6. (a) Out of the noble gases , Xenon form only stable compounds. Explain.

(b) Give the disproportionate reaction of H_3PO_3.

7. (a) Why is the melting point of p-dichlorobenzene higher than that of o-and m-isomers?

(b) Why is a racemic mixture treated as an optically inactive compound ?

8. (i) Under drastic conditions haloarenes are substituted but in presence of electron withdrawing group nuclephillic substitution become easier. Explain.

(ii) Which out of the two halides can easily be substituted and why ?

$CH_3CH_2CH_2Cl$ and $CH_2 = CHCH_2Cl$

9. (a) Distinguish between order and molecularity of a reaction.

(b) What do you mean by the term orientation factor, P, with respect to collision theory ?

10. How would you account the following

(1)Frankel defect is not found in alkali metal halides.

(2)Schotkey defects lower density of the solid.

11. The osmotic pressure of 0.0103 molar solution of an electrolyte is found to be 0.70 atm at 270 c. Cal Vant hoff factor R=0.082Lt mol-1 K -1.

12. (A) Why is hydrochloric acid not used to acidify a permanganate solution in volumetric estimation of Fe^{2+} or $C_2O_4^{2-}$.

(B)Explain enthalpy of atomisation of transition element are high?

13 .Explain: (a) Ambident ligand (b)crystal field splitting in an octahedral field?

14. Explain : (1)Amine does not undergo friedal craft reaction?

(2) convert Aniline to benzonitrile?

15. State Henry's law.What is the effect of temperature on the solubility of a gas in a liquid.

16. The molar conductivity of acetic acid solution at infinite dilution is 390.7 cm^2mol^{-1}. Calculate the molar conductivity of 0.01M acetic acid solution given that the dissociation constant of acetic acid is 1.8×10^{-5}

17. Write difference between molecularity and order of reaction?

18. Derive the relationship between half life of first order reaction and its rate constant?

19. Complete the following:

(1)NH3 +Cl2 (execess)---

(2) XeF4+O2F2-------

20. Draw the structure of following:

1. XeOF4 2. H3PO3

21. Explain on the basis of Valance bond theory that [Ni(CN)4]2- ion with squareplanar structure is diamagnetic and the [NiCl4]2- ion with tetrahedral geometry is paramagnetic.

22. Arrange the following order of properties mentioned

C2H5NH2, C6H5NH2, NH3, (C2H5)2NH (Basic Strength)

C2H5NH2, (C2H5)3N , NH3, (C2H5)2NH (Basic Strength in gases phase)

23. (1) Give one test to distinguish between Methylamine and dimethylamine?

(2)Primary amine have high boiling point than comparable tertiary amine?

24. The unit cell of an element of atomic mass 96 and density 10.3 g/cm3 is a cube with edge length of 314 pm . Find the structure of crystal lattice.

25. Why is the reduction of a metal oxide easier if the metal formed is in liquid state at the temperature of reduction ?

26. Write short note on the following :

(1) Hoffmann's bromamide reaction

(2) Diazotisation

27. [NiCl4]2- is paramagnetic while [Ni(CO)4] is diamagnetic though both are tetrahedral .Why?

28. Out of the following two coordination entities which is chiral (Opticaly active)?

(a) Cis-[CrCl2(ox)2]3- (b) trans-[CrCl2(ox)2]

29. Give simple chemical tests to distinguish between following pairs of compound:

(1) Phenol and Benzooic acid

(2) 1-Propanol and 2-Methyl,2-Propanol

30. (A) What is Lanthanide contraction? What are the consequences of lanthanide contraction

(B). Classify each of the following as being either a p-type or a n-type semiconductor :

(a) Ge doped with In (b) B doped with Si

31. Analysis shows that nickel oxide has the formula NiO.98O1.00. What fractions of nickel exist as Ni2+ and Ni3+ ions ?

32. What do you mean by fuel cell? Write cathode and anode reaction in fuel cell.

33. (a) Out of PO43–,, SO42–,, Cl–,, which wil act as the best coagulating agent for for Fe (OH)3

(b)Explain the following terms :

(i) Electrophoresis, (ii) Coagulation, (iii) Dialysis (IV) Tyndal Effect

34.What is observed

(i) When a beam of light is pressed through a colloidal sol

(ii) An electrolyte, NaCl is added to hydrated ferric oxide sol.

(iii) Electric current is passed through colloidal sol.

35. Find hybridization and DRAW shape i) XeF2 ii) XeO3 iii) XeF4

36. (a) Are all the five bonds in PCl_5 molecule equivalent ?

(b) Complete the following reactions :-

i) $XeF_6 + H_2O \rightarrow$ --- + ---- (partial hydrolysis)

ii) $XeF_6 + H_2O \rightarrow$ --- + ---- (Complete hydrolysis)

iii) $Cl_2 + H_2O \rightarrow$ --- + ----

37. (a) Why are dipole moments of phenols smaller than dipole moments of alcohols ?

(b)Write the mechanism of hydration of ethene to yield ethanol

38. (a) Discuss Williamson systhecis.

(b) Convert anisole to phenol?

39. CH_3CONH_2 is a weaker base than $CH_3CH_2NH_2$.

40. How can you distinguish between 1° and 2° amine ?

41.Write difference between SN1 and SN2 reaction?

3 MARKS QUESTIONS

1. (a) State two important use of salt bridge?

(b)Define molar conductivity. How does it varies with dilution ?

2. Write the chemistry of recharging the lead storage battery , highliting all the materials that are involved during recharging.

3. Give an expression that show that half life period for first order reaction is independent of intial concentration of reacting spesies?

4. Write five difference between order and molecularity?

5. The rate of chemical reaction is doubles for an increase of 10K in an absolute Temperature from 298 K Calculate Ea ?

6. Calculate the half life of a first order reaction from their rate constants given below :

(a) 200 S-1 (b) 2 Min-1 (c) 4 year-1

7. (a) Name the method used for refining of

(i) Nickel (ii) Zirconium

(b) The Extarction of Au by leaching with NaCN envolves both Oxidation and Reduction. Justify giving equations.

8. Arrange the following polymer in increasing order of their molecular forces :

(a) nylon-6, 6, Buna-S, polythene.

(b) nylon-6, Neoprene, polyvinyl chloride.

9. Differentiate between thermo plastic and thermo setting Plastic.

10. What are essential and non essential amino acid. Give two example of each.

11. Why can't vitamin C be stored in our body?

Or

Why except B12 or vitamin B and C can't be stored in our body?

12. (a)Distinguish between the terms homopolymer and copolymer and give an example of each.

(b)Write the name and structure of the monomer unit of the polymer "Dacron".

13. Describe briefly the following :

(a) Mutarotation (b) Anomer (c) denaturation of protein

14. (A) The two strands in DNA are not identical but are complimentary.Explain

(B) What is the effect of denaturation on the structure of protein ?

15. (A) What are biodegradable and non biodegradable detergents? Give an example of each.

(B) How do antiseptic differ from disinfectant ? Give an example of each.

16. (A)How will you bring about the following conversions in not more than three steps :-

(1) Propene to propyne

(2) Ethane to bromo ethane

(B)What happens when Ethyl chloride is treated with alcoholic KOH ?

17. (A) With the help of chemical equations , the method of preparation of potassium dichromate from chromite ore.

(B) Write balanced Ionic equations for what happens when acidified K2Cr2O7 reacts with Ferrous sulphate solution.

18. What are fuel cell ? With the help of a diagram describe the working of a fuel cell

19. (1) What happened when D glucose is treated with (a).HI, (b) HNO3

(2) What is the difference between a nucleotide and nucleoside?

20. (a) Define Kohlrausch,s law?

(b) Explain Zwitter ion structure of amino acid?

21. (a) Write the mechanism of free radical for the polymerization of ethane?

(b) Write monomer of following

(1).Teflon (2) bakelite (3) PVC (4) N-66

22. What expected value of Van,t Hoff factorK3[Fe(CN)6] Iin dilute solution?

23. Explain:

(a) Why is the use of aspartame limited to cold food and drinks?

(b)What problem arises in using Alitame as artificial sweetener?

(c) Explain anti fertility drugs?

24. Write the name of the electrolyte used in (i) fuel cell (ii) mercury cell.

25. (1)What is adsorption isotherm .Describe Freundlich adorption isotherm?

(2)Which of the following electrolyte is most effective for the cogulation of Fe(OH)3 sol and why NaCl,Na2SO4 Na3PO4.

26. Describe the principle of the following:

Van Arkel method, Zone process, electrolytic refining

27. 1. Why does PCl3 fumes in the air?

2 . What is the basicity of H3PO4?

3. How is O3 estimated quantitatively?

28. Prepare the nitric acid and sulphuric acid by Ostwald and CONTACT PROCESS ?

29. Explain why

(1) Vinyl chloride is unreactive in nucleophilic substitution reactions.

(2) The dipolemoment of chlorobenzene is lower than cyclohexyl chloride

(3)What happened when propene is treated with HBr in the presence of Peroxide?

30. (1) Write chemical reaction for Riemer –Tieman reaction, Sandymer reaction.

(2)Give distinguish between primar ,sec,tertury alcohol by Victor Meyer test?

31. (1) Convert Ethano to methanol.

(2)Write the mechanism of hydration of ethane to yield ethanol.

32. With the help of Valence Bond theory predict the shape , magnetic moment and hybridization Of the following compounds :

i) [CoF6]3-- ii) [Ni (CN)4]2—

33. (a) Although electron gain enthalpy of fluorine is less negative than chlorine , fluorine is the stronger oxidizing agent than chlorine. Explain.

(b) Account for the basicity of H3PO4 and H3PO2.. Which one is stronger acid and why?

(c) PCl5 is covalent in the gaseous state but it is ionic in the solid state. Why?

34. For the reaction, 2 NO + Cl2 2 NOCl , it is found that doubling the concentration of both the reactants increases the rate by 8 times, but doubling the concentration of chlorine alone , reaction rate increases by 2 times. What is the overall order of reaction?

35. (a) What is the principle of zone refining ?

(b) How would you prepare blister copper from copper matte?

(c) What is meant by electrometallurgy?

36. (a) Aldehydes are more reactive towards nucleophilic substitution reaction than ketone. Explain.

(b) Write a short note on Wolff- Kishner reduction.

(c) Carboxylic acid is a stronger acid than phenol. Explain.

37. Distinguish between:

i) (a) 1^{o} and 2^{o} amine .

(b) Aniline and ethylamine .

ii) Acetylation of aniline is required to get p-bromoaniline from aniline. Explain.

38. (a) Why is vulcanization of rubber required ?

(b) What is Buna-N ? Write its uses.

(c)What is the difference between thermoplastic and thermosetting polymers?

39. What is the function of ZnCl2 in Lucus test ?

40. How would you carry out the following conversions :-

(a) Phenol to anisole.

(b) 1^{o} alcohol to 2^{o} alcohol .

(c) Benzaldehyde to benzophenone.

41. Write short notes on :

(a) HVZ reaction.

(b) Cannizaro reaction ,

(c) Aldol condensation

42. Malnutrition is a serious concern to school going children .It is very much required to conduct awareness programme in different schools. Suggest some steps to minimize this malnutrition.

43. (1)Name the type of point defect that occur in a crystal of Zinc sulphide?

(2)An element X with atomic no.60g/cm-3 If edge length of its cubic unit cell is 400pm .Identify the type of cubic unit cell. Calculate the radius of an atom of this element?

44. Determine the concentration of silver ion in the cell. GivenE 0 Ag + /Ag=0.80V and Cu2+/Cu=0.34V

45. (a) Structure of XeF2 ?

(b) Write reaction conditions for the manufacturing of sulphuric acid by contact process?

46. (a)Write difference between SN1 and SN2 reaction?

(b)Explain Carbylamine reaction and Riemer Tieman reaction?

47. Explain that Haloalkane react with KCN give alkyle cynide as a main product While with AgCN they form isocynide Give reason?

48. (a)Name the substance that act as antiseptic as well as disinfectant?

(b)Explain the tranquilizer with example?

(c)Give an importance of Chloramphenical?

49. State Henry's law.Give two important applications

5 MARKS QUESTIONS

1. (i) What are meant by positive and negative deviation from Raul.s law ? Explain with graph.

(ii) 100 gm liquid A (molar mass 140) is dissolved in 1000 gm of liquid B (molar mass 180). The vapour pressure of pure liquid B is found to be 500 torr. calculate the vapour pressure of pure liquid A and its vapour pressure pressure in the solution if the total vapour pressure of the solution is 473 torr.

2. (a) Complete the following equations :

(i) $XeF_4 + H_2O$……

(ii) $AgNO_3 + H_2O + H_3PO_2$ ……

(iii) $P_4 + SOCl_2$ …….

(b)Write a short note on brown ring test with equation.

3. (i) Balance the equations :

(a) $Cr_2O_7^{2--} + SO_3^{2--}$ -------- (acid medium)

(b) $MnO_4^{--} + H_2S$---------- (neutral medium)

(ii) Most of the tri-positive ions of lanthanoids are coloured. Explain.

(iii) Melting point of Mn is too low though it has d5 unpaired electrons . Explain.

(iv) Nature of oxides of first 3d series vary .Explain.

4. (a) The conductivity of 0.001028 mol/lt acetic acid is 4.95×10^{-5} S cm-1. Calculate its dissociation constant if $\Lambda_0 m$ for acetic acid is 390.5 S cm^2 mol^{-1} .

(b) Calculate the potential of hydrogen electrode in connect with a solution whose pH is 10.

5. (a) The trend of EM+2/M value for the first transition series are irregular. Explain.

(b) Lanthanides show a limited range of oxidation states but actinides show a wide variety of oxidation states. Explain.

(c) Elements of first 3d, 4d and 5d series exhibit complex compounds. Account for this.

(d) How would you prepare K2Cr2O7 from chromate ore?

6. (A) How will you distinguish between the following pairs of compounds by chemical tests?

(i) Propanal and Propanone

(ii) Acetophenone and benzophenone

(iii) Phenol and benzoic acid

(B) How will you convertin not more than two steps-

(i) Propanone to propene

(ii) benzoicacid to benzaldehyde

7. Assign reason for each of the following:

(*1*) Ce3+ can be easily oxidised to Ce4+.

(*2*) *E*° for Mn3+/Mn2+ couple is more positive than for Fe3+/Fe2+.

(*3*) Transition metals exhibit higher enthalpies of atomization.

(4) Defferentiate the properties of Lanthanoids and actinoids?

(5) Describe with chemical reaction for the preparation of potassium permanganate from pyrolusite ore.

8. Explain why

(1) Vinyl chloride is unreactive in nucleophilic substitution reactions.

(2) The dipolemoment of chlorobenzene is lower than cyclohexyl chloride

(3)What happened when propene is treated with HBr in the presence of Peroxide?

9. (1) Convert Ethano to methanol.

(2) Write the mechanism of hydration of ethane to yield ethanol.

10.(A) How is sulphuric acid acid prepared by Contact process ? Give chemical equations.

(B) Explain the following:-

(i) Nitrogen exist as diatomic molecule but phosphorus as P4. Why?

(ii) Sulphur shows paramagnetic behaviour in vapour state.

(iii)Inter halogen compounds are more reactive than halogen.

11.(A) Arrange the following in the order of prorperty indicated against for each set :-

(i) NH_3, PH_3, AsH_3, SbH_3, BiH_3 (Increasing basic strength)

(ii) F_2, Cl_2, Br_2, I_2 (decreasing order of bond dissocitation energy)

(B)Draw the structure of $XeOF_4$ and SF_6, BrF_3 ?

12. (1) Define onductivity and molar conductivity for the solution of an electrolyte?

(2)Suggest the material other than hydrogen that can be used as a fuel in fuel cell?

(3)Write the cell reaction which occur in lead storage battery

(a)when the battery is in use

(b) when battery is on charging

13.(A) What are fuel cell ? With the help of a diagram describe the working of a fuel cell .

(B) Conductivity of .00241 M Acetic acid solution is 7.896 x 10-5 SCm-1 , calculate its molar conductivity if molar conductivity at infinite dilution for acetic acid is 390.5 SCm2mol-1 . What is its dissociation constant ?

14. (A)With the help of chemical equations , the method of preparation of potassium dichromate from chromite ore.

(B) Write balanced Ionic equations for what happens when acidified K2Cr2O7 reacts with Ferrous sulphate solution.

15. (A)How will you bring about the following conversions in not more than three steps :-

(1) Propene to propyne

(2) Ethane to bromo ethane

(B)What happens when Ethyl chloride is treated with alcoholic KOH ?

16. (i) (a) What is the order of the reaction ?

(b) Calculate the rate constant of the above reaction if the slope is 2 x 10–4 S –1

(ii) Derive the relationship between half life of a first order reaction and its rate constant.

17. (1) At 300 K a certain reaction is 50% completed in 20 minutes. At 350 K, the same reaction is 50% completed in 5 minutes. Calculate the activation energy for the reaction.

(2) What is the difference between average rate and instantaneous rate of a chemical reaction?

(3)Define activation energy of a reaction.

18. (1) Derive an expression for Zero order reaction.(Integrated rate equation)

(2) Derive an expression for first order reaction .(Integrated rate equation)