SWAMY VIVEKANANDA PRE UNIVERSITY COLLEGE
CHANDAPURA-99
II PUC SECOND MONTHLY TEST JULY-2019

TIME: 1 hr   **CHEMISTRY**   MARKS:25

I Answer the following questions   4x1=4

1. What type of binding force existing in non polar molecular solids?

2. What is secondary cell?

3. Which gas is evolved at cathode during the electrolysis of an aqueous solution of sodium chloride?

4. Name the process employed for the purification of nickel?

II Answer any three of the following questions   3x2=6

5. Write anodic and cathodic half cell reactions in Zn-Cu Daniel cell.

6. Give any two applications of Kohlrausch's law.

7. Give any two differences between n-type and p-type semiconductors.

8. Explain Antiferromagnetism and give an example.

III Answer any five of the following questions   5X3=15

9. How is pure alumina obtained from bauxite by leaching process.

10. Give the reactions takeplace in the blast furnace during the extraction of iron.

11. Calculate packing efficiency in Body-centered cubic lattice.

12. Draw the neat diagram of H_2-O_2 fuel cell and write cathodic reaction.

13. State Faraday's first and second law of electrolysis. Write symbolic notation of SHE.

14. Calculate the electrode potential of Zn electrode immersed in 0.01M $ZnSO_4$ solution at 298 K . $E^0_{Zn^{2+}}$ = -0.76 V

15. Define F-centre and Calculate number of particles in bcc.

16. Name any two crystal systems. How does Frenkel defect affect the density of a solid?
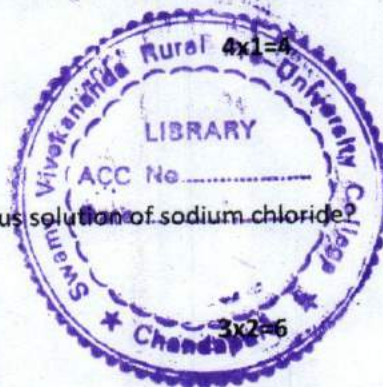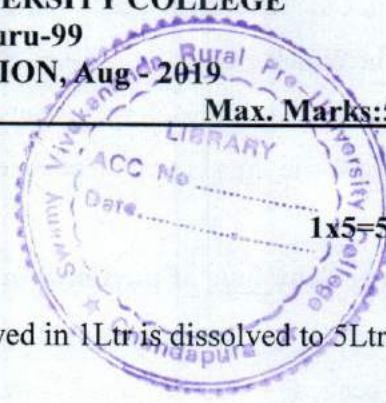
SWAMY VIVEKANANDA RURAL PRE-UNIVERSITY COLLEGE
Chandapura, AnekalTq., Bengaluru-99
II PUC FIRST QUARTERLY EXAMINATION, Aug - 2019

Time: 1hr 40 Mins   SUB: CHEMISTRY   Max. Marks:50

PART – A

I Answer the following questions.   1x5=5

1. What is the Vant Hoff factor of aluminium sulphate?

2. What happens to molar conductivity when 1M KCl dissolved in 1Ltr is dissolved to 5Ltrs?

3. Name the radioactive element in group 16.

4. What is lanthanoid contraction?

5. Give an example for geminal-dihalide.

PART B

II Answer any _five_ of the following questions.   2x5=10

6. Write a note on ferromagnetism.

7. Define co-ordination number. What is the co-ordination number in hcp ?

8. What happens to the solubility of a gas in a liquid with increase in temperature? Give reason.

9. Give two importances of electrochemical series.

10. Calculate the electrode potential of electrode formed when Zinc rod is dipped in 0.02M $ZnSO_4$ solution at 298K. $E^0_{Zn2+/Zn} = -0.76V$.

11. What is an optical isomerism? Give an example.

12. Write the structure of DDT and write its IUPAC name.

PART C

III Answer any _five_ of the following questions.   3x5=15

13. Calculate the packing efficiency of simple cubic lattice.

14. An element having atomic mass 63.1g/mol has fcc unit cell with edge length 3.608×10^{-8}cm. calculate the density of the unit cell?

15. Write the formula, structure and basicity of pyrophosphorous acid.

16. Describe the manufacture of nitric acid by Ostwald's process.

17. Complete the following equations.

    a. $2KClO_3 \xrightarrow{\quad MnO_2 \quad}$

    b. $NaOH + P_4 \longrightarrow$

    c. $Cu + con.HNO_3 \longrightarrow$
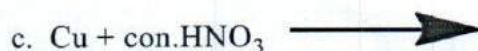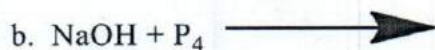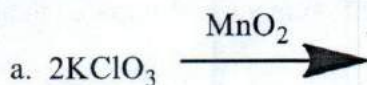
18. Explain the manufacture of potassium dichromate from chromite ore.

19. a. Calculate the magnetic momentum of Fe^{2+}. (2)

   b. Which element of 3d-series produces maximum oxidation state?(1)

20. a. Why d- block elements acts as a good catalyst?(2)

   b. Write the general electronic configuration of f-block elements(1).

PART D

IV Answer any four of the following questions.   5x4=20

21. a. 1.0g of a non-electrolyte solute dissolved in 50g of benzene lowered the freezing point of benzene by 0.40K. K_f of benzene is 5.12Kkg/mol. Calculate the molar mass of the solute.(3)

   b. State Raoult's law of (a) lowering of vapour pressure (b) partial vapour pressure.(2)

22. a. Write three differences between ideal and non-ideal solutions.(3)

   b. Define isotonic solution. What happens when the blood cell is dipped in a solution containing more than normal saline concentration? (2)

23. a. Explain the mechanism of rusting of iron.(3)

   b. Write Nernst equation and explain the terms.(2)

24. a. Calculate the equilibrium constant of the reaction at 298K(3)

   $$Mg + 2Ag^+ \longrightarrow Mg^{2+} + 2Ag. \quad E^0_{cell} = +3.16V$$

   b. Mention any two factors on which conductivity of an electrolyte solution depends.(2)

25. a. Explain Reimer-Tiemann reaction with example.(2)

   b. 0-nitro phenol is steam volatile but not p-nitro phenol. Why?(2)

   c. What is the effect of electron with drawing group on the acidity of phenol?(1)

26. a. How phenol is manufactured by cumene process?(2)

   b. Explain Williamson's ether synthesis with an example.(2)

   c. Complete the equation (1)
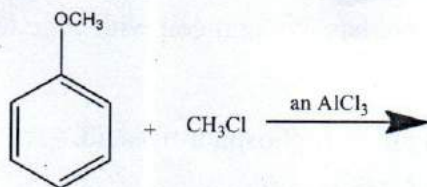
27. a. Explain the mechanism of conversion of methyl chloride into methanol?(2)

   b. Aryl halides are less reactive towards nucleophilic substitution reaction compared to alkyl hallides. Give two reasons. (2)

   c. $CH_3Br + AgF \longrightarrow CH_3F + AgBr$. Name the reaction. (1)

Time: 3hr 15 Mins   SUB: CHEMISTRY   Max. Marks:70

PART – A

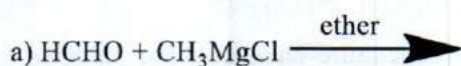**I Answer the following questions.**   1x10=10

1. Define the term molarity.

2. Name the law behind the dissolution of CO_2 gas in soft drinks under high pressure.

3. The rate equation for the reaction $A + B \longrightarrow D$ is rate $= K[A]^{1/2} [B]^2$. what is the order of the reaction?

4. For the reaction $2HI \longleftrightarrow H_2 + I_2$. Write its molecularity.

5. What is the role of depressant in Froth- Flotation method?

6. Why HI is stronger acid than HF in aqueous solution?

7. Give the structure of chlorous acid.

8. Define enantiomers.

9. Name the reagent used in Etard's reaction.

10. Why Formaldehyde don't undergo Aldol condensation?

PART B

II Answer any _five_ of the following questions.   2x5=10

11. Give the differences between crystalline and amorphous solid with respect to shape and melting point.

12. A first order reaction is found to have a rate constant $K = 5.5 \times 10^{-4}$/s. Find the half life of reaction.

13. Name the gases liberated at anode and cathode respectively when an aqueous solution of NaCl is electrolysed.

14. In the extraction of Al by electrolysis.

    a) Give the composition of electrolyte used.

    b) Role of cryolite.

15. Give reason: a) Actinoids generally show variable oxidation state.

    b) Lanthanoids are less reactive than actinoids.

16. Name the product formed when Chloro methane reacts with.

   a) aqueous KOH b) alcoholic AgCN.

17. Complete the following equations.

    a) $HCHO + CH_3MgCl \xrightarrow{\text{ether}}$

    b) $CH_3COCH_3 + CH_3MgCl \xrightarrow{\text{ether}}$

18. Explain Stephen's reduction reaction.

PART C

III Answer any _five_ of the following questions.   **3x5=15**

19. How is blister copper obtained from copper matte by Bessemerisation?

20. a) Explain Van Arkel method for refining of Zr with equations.(2)

    b) Name the reagent used for the extraction of iron below 1073K.(1)

21. a) Write any two anomalous properties of nitrogen.(2)

    b) Write the structure of hypo phosphorous acid.(1)

22. Explain the equations involved in the manufacture of sulphuric acid by contact process.

23. Complete the following equations.

    a) $4HCl + O_2 \xrightarrow{\text{CuCl}_2}$

    b) $6NaOH + 3Cl_2 \longrightarrow$

    c) $F_2 + Cl_2 \longrightarrow$
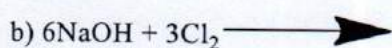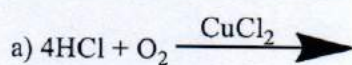
24. Write the reactions reactions involved in the preparation of Potassium permanganate by pyrolusite ore.

25. a) Give an example for the compound of Mn where Mn show +7 oxidation state.(1)

    b) Calculate the magnetic momentum of Mn^{2+} .(2)

26. a) What happens when H_2S is passed into $K_2Cr_2O_7$ in acidic medium? Give equation.(2)

    b) What is the composition of Chromite ore?(1)

PART D

IV Answer any _three_ of the following questions.   **5x3=15**

27. a) Calculate the packing efficiency in fcc arrangement.(3)

    b) What is the co-ordination number in a) sc and b) bcc?(2)

28. a) 31g of an unknown molecular material is dissolved in500g of water. The resulting solution freezes at 271.14K. Calculate the molar mass of the material [Given K_f of H_2O = 1.86Kkg/mol, T^0_f of H_2O = 273K](3)

    b) What is reverse osmosis? Mention its uses.(2)

29. a) Calculate standard free energy change for the reaction $Zn + 2Ag^+ \longrightarrow Zn^{2+} + Ag$, E^0_{cell} =1.56V. [Given F = 96500C/mol].(3)

    b) Write the reaction occurring at cathode and anode in H_2-O_2 fuel cell.(2)

30. a) The rate of the particular reaction doubles when the temperature changes from 300K to 310K. Calculate the energy of activation energy of the reaction.(3)

b) Show that half life period of a first order reaction is independent of initial concentration of reactant species.(2)

31. a) According to collision theory, what are the two factors that leads to effective collision?(2)

b) Draw the graph of potential Vs reaction co-ordinate for the effect of catalyst and the rate of reaction.(2)

c) Define pseudo first order reaction.(1)

V Answer any _four_ of the following questions.   **5x4=20**

32. a) Explain S_N1 mechanism with an example.(3)

b) Give one example to the following reaction i) Sandmeyers reaction ii) Wurtz-Fittig reaction.(2)

33. a) Explain Swart's reaction with an example.(2)

b) Explain Fittig reaction.(2)

c) Write the formula of Grignard reagent.(1)

34. a) Explain the mechanism of acid catalysed dehydration of ethanol to ethene.(3)

b) How would you prepare ether by Williamson's synthesis?(2)

35. a) Explain Kolbes reaction with an example.(2)

b) Among alcohols and phenols which is more acidic. Why?(2)

c) Give an example of mixed ether.(1)

36. a) What is the action of dil.NaOH on acetaldehyde? Write the name of the reaction.(3)

b) Explain esterification reaction with an example.(2)

37. a) explain Gatterman – Koch reaction with an example.(2)

b) Explain Cannizaro's reaction with an example.(2)

c) What is Tollen's reagent?(1)

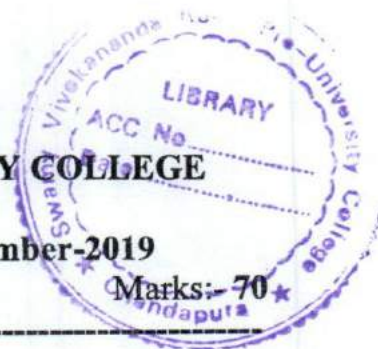xxxxxxxxxxx

SWAMY VIVEKANANDA RURAL PRE - UNIVERSITY COLLEGE
Chandapura, Bangalore-south

Time: 3 hours   **First Preparatory Examination-December-2019**

**Class:-II PUC**   **Sub:- CHEMISTRY**   **Marks:- 70**

PART-A

I Answer the following questions.   10X1=10

1. How does the size of blood cells change when placed in an aqueous solution containing more than 0.9%(m/v) sodium chloride?.
2. How does volume change on mixing two volatile liquids to form an ideal solution?
3. Draw a graph λ_m V/s $\sqrt{C}$ for acetic acid solution.
4. Unit of rate constant of a reaction is same as that of its rate. What is the order of reaction?
5. Name the enzyme used in the inversion of cane sugar.
6. What is copper mate?
7. Name the noble gas having $ns^2\ np^6$ electronic configuration but does not have d-orbital in its valence shell.
8. Write the general equation for Wurtz reaction along with conditions.
9. What is the reagent used in the following equation?

$$RCOOH \xrightarrow{\Delta} RCH_2OH$$
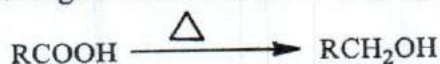
10. Which vitamin deficiency cause the disease pernicious anaemia?

PART-B

II Answer any FIVE of the following questions.   5X2=10

11. Silver forms ccp lattice and X-ray studies of its crystals shows that edge length of its unit cell is 408.6pm.Calculate the density of silver .(At.Mass of Ag is 108 gmol^{-1})
12. What is corrosion ?Mention a general method to prevent it.
13. Write the Arrhenius equation and mention what each term stands for.
14. Give any two differences between lanthanides and actinides.
15. How does acetyl chloride react with anisole in presence of anhydrous aluminium chloride catalyst, write the chemical equation of the reaction.
16. What are the effects of electron withdrawing and electron donating groups on acidity of carboxylic acids.
17. What are antacids? Give an example
18. What are food preservatives ? Give one example.

PART-C

III Answer any FIVE of the following questions.   5X3=15

19. How is pure alumina obtained from bauxite by leaching process?
20. Write the reactions that takes place during the manufacture of nitric acid by Ostwald's process.
21. (a) How is ozonized oxygen prepared.(2)

    (b) Write the structure of sulphurous acid.(1)

22. Complete the following equations

    (a) $CH_4 + 2O_2 \text{------------}\rightarrow$

    (b) $2Fe^{3+} + SO_2 + 2H_2O \text{---------------}\rightarrow$

    (c) $C_{12}H_{22}O_{11} \xrightarrow{Con.H_2SO_4}$

23. Give one reasons for each of the following

    (a) Transition metals are good catalytic agents.

    (b) Second ionization energy of copper is very high.

    (c) The spin only magnetic moment of Sc^{3+} is zero (Z=21).

24. Write the equations involved in the preparation of $K_2Cr_2O_7$ from chromite ore.

25. With the help of valence bond theory account for (a) hybridization (b) geometry (c) magnetic property (d) is it inner or outer orbital complex of $[COF_6]^{-3}$

26(a) For the given complex $[CO(NH_3)_5Br]SO_4$. Write the IUPAC name and its ionization isomer. (2)

   (b) Which set of d--orbital of ion/atom experience more repulsion in octahedral field created by the ligand? (1)

PART-D

IV Answer any THREE of the following questions.   5X3=15

27. (a) Calculate the packing efficiency of bcc. (3)

   (b) If a metal with atomic mass 209 crystallizes in a simple cubic lattice what is the edge length of its unit cell (given d=91.5kg/m³) (2)

28. (a) 5.8g of non-volatile solute was dissolved in 100 g of CS_2 (Molar.Mass =76gmol⁻¹).The vapour pressure of pure CS_2 is 195 mm Hg (3)

   (b) What are azeotropes? Give examples. (2)

29.(a) Derive an expression for rate constant of a zero order reaction . (3)

   (b) What is the effect of positive catalyst on energy of activation? (2)

30. (a)The resistance of M/10 solution is found to be 2.5X10³ ohms .Calculate molar conductance (given cell constant = 1.15 cm³). (3)

   (b) Give two methods for prevention of corrosion. (2)

31. (a)Mention two factors which effect adsorption of gas on a solid . (2)

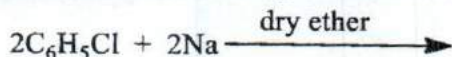   (b) Mention two characteristics of enzyme catalyst. (2)

   (c) Among $Al_2(SO_4)_3$ and $(NH_4)_2SO_4$ which is better coagulating agent for a –ve sol.? (1)

PART-E

IV Answer any FOUR of the following questions.   5X4=20

32.(a) Complete the following reaction and write its name (2)

$$2C_6H_5Cl + 2Na \xrightarrow{\text{dry ether}}$$

   (b) Explain Zaitsev rule with an example. (2)

   (c) A haloalkane when boiled with aq (KOH) give an alcohol having inversed configuration. Name the mechanism involved in this reaction. (1)

33.(a) Explain the mechanism of acid catalyzed dehydration of ethanol to ethane. (3)

   (b) Explain Kolbe's reaction with equation. (2)

34.(a) How benzene is converted into benzaldehyde by Gatterman –Koch reaction? Write equation.(2)

   (b) Complete and name the following reaction (2)

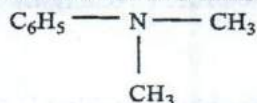$$>C=O \xrightarrow[\text{HCl}]{\text{Zn-Hg}}$$
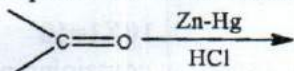
   (c) What is the effect of EWG on the acidity of carboxylic acid? (1)

35.(a) Explain carbylamine reaction with equation . (2)

   (b) How does nitrobenzene is reduced to aniline? Give equation. (2)

   (c) Write the IUPAC name of (1)

$$C_6H_5 - \underset{\underset{CH_3}{|}}{N} - CH_3$$

36. (a) Write the Haworth structure of lactose . (2)

   (b) (i) What are non-essential amino acids? (1)

      (ii)Write zwitter ionic structure of glycine. (1)

   (c) Name the nitrogenous base present in RNA but not in DNA. (1)

37.(a) Explain the preparation of nylon-6, 6 with equation. (2)

   (b) What are thermoplastic polymers? Give an example. (2)

   (c) Write the structure of isoprene. (1)

SWAMY VIVEKANANDA RURAL PRE - UNIVERSITY COLLEGE

Chandapura, Bangalore-south

Time: 3 hours **Second Preparatory Examination-January-2020**

Class:-II PUC **Sub:- CHEMISTRY** **Marks:- 70**


PART-A

I Answer the following questions. 10X1=10

1. Components of a non- ideal binary solution can't be completely separated by fractional distillation. Why ?
2. Name the disease caused to the people living at high altitude or climber.
3. What is the use of platinum foil in the standard hydrogen electrode?
4. What is the order of a reaction whose rate expression is rate = $K[A]^{3/2}[B]^{-1}$
5. Name the flux used to remove iron impurity from molten copper matte.
6. Which is the first noble gas compound synthesized ?
7. What are homoleptic complexes ?
8. Give IUPAC name of $CH_2=CH-Cl$
9. Which oxidizing agent is used in Etard's reaction ?
10. Glucose on oxidation with bromine water gives gluconic acid. What does this reaction indicate about the structure of glucose ?
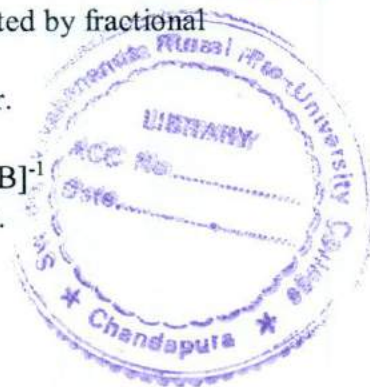
PART-B

II Answer any FIVE of the following questions. 5X2=10

11. What are intrinsic semiconductors? Give example.
12. State Faraday's second law of electrolysis and write its mathematical expression.
13. Name the factors affecting the rate of a reaction.
14. Give two consequences of lanthanide contraction.
15. How anisole reacts with acetyl chloride in the presence of anhydrous $AlCl_3$.
16. What is the action of ammonia on benzoic acid? Write equation.
17. Give an example for non- narcotic analgesics and antiseptic.
18. What are anionic detergents ? Give an example.

PART-C

III Answer any FIVE of the following questions. 5X3=15

19. Write the equations of different zones during the extraction of Iron from blast furnace.
20. How is ammonia manufactured by Haber's process?
21. Complete the following equations.

    a) $Cu + 2H_2SO_4 \longrightarrow CuSO_4 +$ -------- $+ 2H_2O$

    b) $SO_3 + H_2O \longrightarrow$ ---------

    c) $Cl_2 + 2H_2O + SO_2 \longrightarrow$ ------ $+$ --------

22. (a) How is PCl_3 prepared from thionyl chloride ?(2)
    (b) What happens when PCl_5 is heated.(1)
23. (a) How is $KMno_4$ manufactured from pyrolusite.(2)
    (b) Write general electronic configuration of d-block elements.(1)
24. Give reason.
    (a) The outer electronic configuration of Cu is $3d^{10} 4S^1$ instead of $3d^9 4S^2$.
    (b) Sc^{3+} salts are diamagnetic.
    (c) Which of the following ion is coloured ? Sc^{3+}, Zn^{2+} and Cr^{3+}.
25. With the help of VBT, Explain hybridization, geometry and magnetic property of $[NiCl_4]^{2-}$.
26. a) Explain linkage isomerism with example.(2)
    b) Write the geometrical isomerism of $[Co(NH_3)_4Cl_2]^+$.(1)

PART-D

IV Answer any THREE of the following questions. 5X3=15

27. (a) Calculate the packing efficiency of simple cube.(3)
    (b) An element having atomic mass 60 has fcc cubic unit cell. The edge length of the unit cell is 400pm. Find the density of the unit cell.(2)
28. (a) A solution containing 18g of non-volatile non-electrolyte solute is dissolved in 200g of water freezes at 270.07K. Calculate the molecular mass of solute given K_f = 1.86K/Kg/M. Freezing point of water = 273K.(3)
    (b) With help of vapour pressure – temperature diagram, Explain elevation in boiling point.(2)
29. (a) Which substances are used as the anode and cathode in dry cell? What is the electrolyte used? Write the reactions at each electrode.(3)
    (b) What are electrolytes and non-electrolytes?
30. (a) Derive an integrated rate equation of first order reaction.(3)
    (b) 75% of first order reaction is completed in 30min. Calculate rate constant of the reaction.(2)
31. (a) Give any two characteristics of chemisorption.(2)
    (b) Write a note on selectivity of catalyst.(2)
    (c) Define Tyndall effect.(1)

PART-E

IV Answer any FOUR of the following questions. 5X4=20

32. (a) Explain the mechanism of S_N2 reaction.(2)
    (b) Aryl halides are less reactive towards nucleophilic substitution reactions. Give two reasons.(2)
    (c) Define specific rotation.(1)
33. (a) Explain the mechanism of hydration of ethene to ethanol.(3)
    (b) How would you prepare ethers by dehydration of alcohols?(2)
34. (a) How does benzaldehyde reacts with acetophenone in presence of dil.alkali?(2)
    (b) Among formic acid and acetic acid, which is more acidic? Give reason?(2)
    (c) Name the product formed when acetaldehyde reacts with HCN.(1)
35. (a) How primary amine is prepared by Hoffmann bromamide degradation reaction? Write equation.(2)
    (b). How is aniline converted into phenylisocyanide? Write the equation.(2)
    (c). Why primary aromatic amine can't be prepared by Gabriel synthesis?(1)
36. (a). What are reducing sugars? Is sucrose a reducing sugar? Give reason.(3)
    (b). Deficiency of which vitamin leads to night blindness?(1)
    (c). Which harmone is responsible for the hyperthyroidism?(1)
37. (a). What are elastomers? Give example.(2)
    (b). Write the partial structure of nylon6,6 and Bakelite.(2)
    (c). What is vulcanization of rubber?(1)

****