Roll Number		

SET B

INDIAN SCHOOL MUSCAT
FIRST PRELIMINARY EXAMINATION
CHEMISTRY

CLASS: XII | Sub. Code: 043 | Time Allotted: 3 Hrs

13.01.2019 | Max. Marks:70

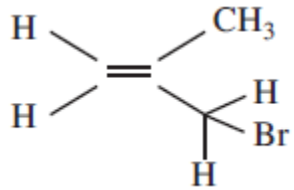
General Instructions:

(a) All questions are compulsory.
(b) Section A: Q.no. 1 to 5 are very short answer questions and carry 1 mark each.
(c) Section B: Q.no. 6 to 12 are short answer questions and carry 2 marks each.
(d) Section C: Q.no. 13 to 24 are also short answer questions and carry 3 marks each.
(e) Section D: Q.no. 25 to 27 are long answer questions and carry 5 marks each.
(f) There is no overall choice. However, an internal choice has been provided in two questions of one mark, two questions of two marks, four questions of three marks and all the three questions of five marks weightage. You have to attempt only one of the choices in such questions.
(g) Use of log tables if necessary, use of calculators is not allowed.

SECTION A

1. How many atoms per unit cell are present in body centered unit cell? 1

2. Write the IUPAC name of 1

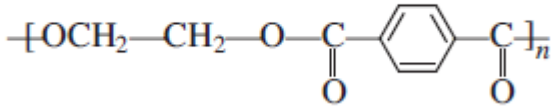


3. Which of the following is more stable complex and why? 1
   $[Co(NH_3)_6]^{3+}$ and $[Co(en)_3]^{3+}$

OR

Write the IUPAC name of $[Fe(en)_2Cl_2]Cl$

4. Is this a homo polymer or copolymer? 1



5. Write the logarithmic expression of Freundlich adsorption isotherm 1

OR

What do you understand by electro kinetic potential?

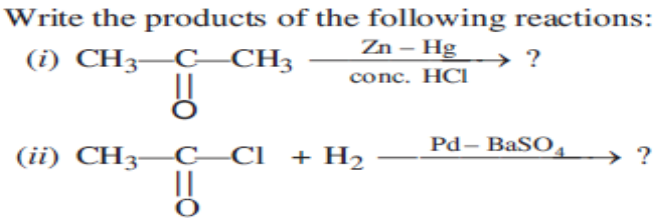
SECTION B

6. a) Define molal elevation constant (K_b) 2
   b) Why are the molecular masses of polymers determined by osmotic pressure method?

7. Show that the half-life of a first order reaction is independent of the initial concentration of the reactants. 2

8. Draw the structures of following: XeO_3, $H_2S_2O_8$ 2

9. Write the products of the following reactions: 2



10. Explain the preparation of potassium permanganate from pyrolusite ore. 2

OR

Complete the following equations
   a) $Fe^{2+} + Cr_2O_7^{2-} + H^+ \rightarrow$
   b) $MnO_4^- + S_2O_3^{2-} + H_2O \rightarrow$

11. Write the structures of the monomers of the following polymers: 2
(a)Neoprene (b) Bakelite

12. Name the reagent(s) used to convert phenol to 2
   a) benzene
   b) benzoquinone

SECTION C

13. Write chemical equations when 3
   a) Ethyl chloride is heated with silver fluoride
   b) Chlorobenzene is treated with CH_3COCl in the presence of anhydrous $AlCl_3$
   c) Benzyl alcohol is treated with thionyl chloride

OR

Account for the following
   i) Ethyl iodide undergoes faster SN_2 than ethyl bromide
   ii) p-dichlorobenzene has higher melting point than those of ortho or meta isomers
   iii) Haloarenes are less reactive to nucleophiles

14. An element crystallizes in fcc with edge length 200 pm. Calculate its density if 200grams of this element contains 24×10^{23} atoms. [$Na=6.023 \times 10^{23}$] 3

15. a) What is the composition of copper matte? 3
   b) Describe Mond's process of refining nickel

16. Explain what is observed when 3
    a) An electric current is passed through a sol
    b) A beam of light is passed through a sol
    c) An electrolyte is added to ferric hydroxide sol

OR

Write one difference between
    i) Lyophobic and lyophilic colloids
    ii) Heterogenous and homogenous catalysis
    iii) Macromolecular and associated colloids

17. 2g of benzoic acid dissolved in 25g of benzene shows a depression in freezing point equal to 1.62K. What is the percentage association of acid if it forms dimer in solution? [Given K_f for benzene 4.9K kg/mol, molar mass of benzoic acid=122g/mol, molar mass of benzene=78g/mol] 3

18. What happens when D-glucose is treated with 3
    a) HI b) NH_2OH c) Br_2 water

OR

What are fibrous and globular proteins? Give an example each.

19. Give reason for the following 3
    a) Of the d^4 species, Cr^{2+} is strongly reducing whereas Mn^{3+} is strongly oxidizing
    b) Cu^+ ion is not stable in aqueous solutions
    c) Transition metals generally form colored compounds

20. a) How will you distinguish between benzoic acid and phenol? 3
    b) Illustrate the following with chemical equations
    i) Aldol condensation
    ii) Gattermann-Koch reaction

21. A first order reaction takes 20 minutes for 25% decomposition. Calculate the time when 75% of the reaction will be completed. [Given: log 2=0.3010, log 3=0.4771, log4=0.60201] 3

OR

The following data were obtained during the first order thermal decomposition of SO_2Cl_2 at a constant volume

$SO_2Cl_{2(g)} \rightarrow SO_{2(g)} + Cl_{2(g)}$

Experiment	Time/s^{-1}	Total pressure/atm
1	0	0.4
2	100	0.7

Calculate the rate constant. [given log 4=0.6021, log 2=0.3010]

22. Write the mechanism of dehydration of ethanol at 443K. 3

23. Mention the action of the following on the human body in bringing relief from a disease 3
    a) Cimetidine
    b) Chloramphenicol
    c) Aspirin

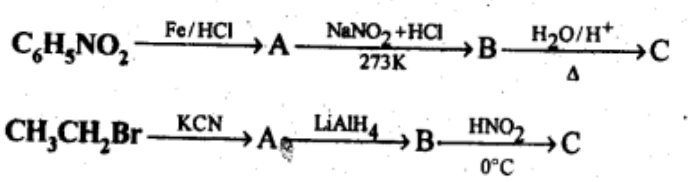
24. a) Write IUPAC name of $[Co(en)_3]^{3+}$. 3
    b) Why is $[NiCl_4]^{2-}$ paramagnetic but $[Ni(CO)_4]$ is diamagnetic?
    c) On the basis of crystal filed theory, write the electronic configuration of d^4 ion, in an octahedral field, when $\Delta_o > P$.

SECTION D

25. A colorless substance A[C_6H_7N] is sparingly soluble in water and gives water soluble compound on treating with mineral acid. On reacting with chloroform and alcoholic potash A forms obnoxious smell due to the formation of compound B. Reaction of A with sodium nitrite and hydrochloric acid at low temperature gives a compound C, which on reacting with phenol in alkaline medium gives an orange dye D. Identify the structures of A, B, C and D. Also write the equation of conversion of C to D. 5

OR

    a) Illustrate Hoffmann bromamide degradation reaction.
    b) Convert aniline to benzene nitrile.
    c) Why primary aromatic amines be not prepared by Gabriel phthalimide synthesis?
    d)



26. a) Write the name of the cell generally used in hearing aids. Write the reactions taking place at the anode and the cathode of the cell. 5
    b) Calculate the mass of silver deposited at the cathode when a current of 2 amperes was passed through a solution of silver nitrate for 10 minutes.
    c) Calculate the emf of the following cell at 298 K
    $Mg_{(s)}/Mg^{2+}(0.1M)//Cu^{2+}(0.001M)/Cu_{(s)}$
    Given: E^o_{cell}=+2.71V, 1F=96500C/mol

OR

    i) State Kohlrausch's law of independent migration of ions.Give two applications of this law.
    ii) In a copper-silver cell, the concentration of copper ions is 0.10M and the concentration of silver ions is not known. The cell potential when measured was 0.422V. Determine the concentration of silver ions in the cell. [Given $E^0_{Ag+/Ag}$=+0.80V, $E^0_{Cu^{2+}/Cu}$=+0.34V]

27. a) Complete the following 5
        i) $XeF_4+O_2F_2\rightarrow$
        ii) NaOH(hot conc.) + $Cl_2\rightarrow$
    b) Account for the following
        i) H_3PO_2 is a stronger reducing agent than H_3PO_3
        ii) Noble gases have low boiling points
    c) Arrange oxoacids of chlorine in increasing order of oxidizing power.

OR

i) Explain Haber's process
ii) Why is ICl more reactive than Cl_2?
iii) Name the allotrope of
    a) sulphur that is stable at room temperature b) phosphorus that is more reactive.
iv) What happens when sulphur dioxide gas is passed through an aqueous solution of Fe(III)salt?

End of the Question Paper