	THE JAIN INTERNATIONAL SCHOOL, BILASPUR				
	A JGI Institution				
PRE BOARD EXAMINATION – III (2014-15)					
CLASS :	XII	SUBJECT :	CHEMISTRY	TIME :	3 Hours

General Instructions:

(i) All questions are compulsory.
(ii) Marks for each question are indicated against it.
*(iii) Question numbers **1 to 5** are very short-answer questions and carry **1** mark each.*
*(iv) Question numbers **6 to 10** are short-answer questions and carry **2** marks each.*
*(v) Question numbers **11 to 22** are also short-answer questions and carry **3** marks each.*
*(vi) Question number **24** is value based question and carries **4** mark.*
(vii) Question numbers **24 to 26** are long-answer questions and carry **5** marks each.

*(viii) Use Log Tables, if necessary, Use of calculators is **not** allowed.*

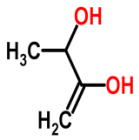
1. Calculate the no. of atoms in FCC crystal.
2. Enthalpy of adsorption in chemisorption is high .Why ?
3. The boiling point of ethers are lower than isomeric alcohols.Give reason.
4. Write the Aldol condensation reaction.
5. Ethylamine is soluble in water whereas Aniline is not.Comment.
6. Calculate emf of the cell in which the following reaction takes place:

   $Ni(s) + 2Ag^{+}(0.002M) \longrightarrow Ni^{2+}(0.160M) + 2Ag(s)$.

   Given that $E^{\Theta}cell = 1.05$ V.
7. What is lanthanoid contraction ? Give two consequences of lanthanoid contraction.

   OR

   Describe the preparation of Potassium dichromate from Iron chromite ore.What is the effect of increasing pH on a solution of Potassium dichromate ?
8. Why do Haloarenes not undergo Nucleophilic substitution reaction easily ? Explain.

9. a) Write the IUPAC nomenclature of 

b) How can we separate a mixture of o- nitrophenol and p-nitrophenol ? Explain.

11.a) An element has molar mass 2.7×10^{-2} kg mol^{-1} ,forms a cubic unit cell with edge length 405 pm. If its density is 2.7×10^{3} kg m^{-3},what is the nature of cubic unit cell ?

b) How can you create n-type and p-type semiconductors ? Give example.

12. a) Give the balanced chemical equation for the following:

(i) Chlorine reacts with excess NH_3.
(ii) Copper reacts with conc.H_2SO_4.
b) Why is H_2S more acidic than H_2O ?

13. a) What are emulsions? Explain its types giving one example of each.

b) Why are most medicines colloidal in nature ?

14. a) Describe the refining method of Zirconium .

b) Explain Zone refining with diagram.

c) What is the role of slag in blast furnace in the extraction of Iron ?

OR

a) Explain the extraction of Aluminium from pure alumina. Draw a neat diagram of the electrolytic cell involved.

b) What is a depressant in Froth floatation process ?

15. i)Write the IUPAC name of $[Co(NH_3)_3Cl_3]$.

ii) Compare the hybridization and geometry of $[Co(NH_3)_6]^{3+}$ and $[Ni(NH_3)_6]^{2+}$

16. i) Bring about the following conversions :

a) Ethanal to 2-Methlypropan-2-ol.

b) Phenol to Salicylic acid.

17. Explain the following facts :

(a) Transition metals form complex compounds.
(b) Chromium group elements have the highest melting points in their respective series.
(c) Transition metals form interstitial compound.

18. Write :

(a) Give one example each of Homopolymer and Copolymer.
(b) Monomer unit of Bakelite and Buna-S.
(c) Difference between Nylon-6 and Nylon-6,6.

19. Give reason :

(a) An electrochemical cell stops working after sometime.

(b) An alkaline medium prevents the rusting of Iron .

(c) Conductivity of a solution decreases with dilution.

20.a) Name the following :

(i) First artificial sweetener discovered.

(ii) Components of Dettol.

(iii) An antibiotic used for treatment of TB.

(iv) An antipyretic.

b) How are Antibiotics different from Antiseptics ? Give one example of each type.

21. a) The decomposition of N_2O_5 (g) is a first order reaction with a rate constant of

5×10^{-4} sec^{-1} at 45^0C i.e.

$2N_2O_5$ (g) ⟶ $4NO_2$ (g) + O_2 (g).

If initial concentration of N_2O_5 is 0.25 M, calculate its concentration after 2 minutes.

b) Time required to decompose SO_2Cl_2 to half of its initial concentration is 60 mins.

If the decomposition is a first order reaction,calculate the rate constant of the reaction.

22. Complete and name the following reactions :

i) $RNH_2 + CHCl_3 + KOH$ ⟶

ii) $RCONH_2 + Br_2 + NaOH$ ⟶

iii) $C_2H_5NH_2 + HNO_2$ ⟶

*23. Ames and James are good friends studying in class 12 in Bilaspur.James has difficulty in seeing in the dark.Ames had observed that James eats mainly junk food devoid of green veggies or fruits so he advised him to take balanced diet and milk.

a) Name the eye disease James is suffering from.
b) Name the vitamin deficiency responsible for this disease.Name its sources.
c) How are vitamins classified on the basis of solubility ?
d) What values are shown by Ames ?

24. a) Complete the following chemical equations :

i) $PCl_3 + H_2O$ ⟶

ii) $XeF_2 + H_2O$ ⟶

b)Account for the following :

i) The boiling point of Noble gases is very low.

ii) ICl is more reactive than I_2.

iii) Nitrogen exists as N_2 while Phosphorus as P_4.

OR

a) Complete the following chemical equations :

i) $HCl + O_2 \longrightarrow$

ii) $I_2 + HNO_3 \longrightarrow$

b) Account for the following :

i) NH_3 forms Hydrogen bonds but PH_3 does not.

ii) PCl_5 cannot act as a reducing agent.

iii) $R_3P{=}O$ exists but $R_3N{=}O$ does not.

25. i) Illustrate the following name reactions :

a) Cannizzaro Reaction

b) Wolf Kishner Reduction

ii) Give simple Chemical test to distinguish between the following pairs of compounds :

a) Benzaldehyde and Acetophenone.

b) Propanol and Propanal.

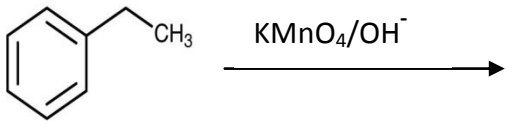
OR

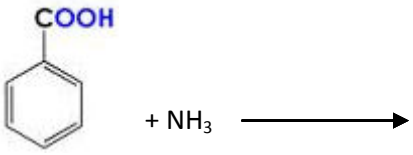
i) Illustrate the following name reactions :

a) Rosenmund Reduction

b) Hell-Volhard-Zelinsky Reaction

ii) Complete each synthesis by giving products in the following:

a) 

b) 

26. a) Explain the following :

i) Henry's Law ii) Raoult's Law

b) A solution of glycerol ($C_3H_8O_3$) in water was prepared by dissolving some glycerol in 500 g of water.This solution has a boiling point of 100.42 ^{0}C.What mass of glycerol was dissolved to make this solution ? (K_b for water = 0.512 K kg mol^{-1})

OR

a) Calculate the osmotic pressure in pascals exerted by a solution prepared by dissolving 1.0 g of polymer of molar mass 185,000 in 450 ml of water at 37^{0}C.
b) Explain Reverse osmosis and its application in Desalination with diagram.

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