

International Indian School Dammam

First Term Examination, June 2013

Class: XII

Subject: Chemistry

SET: A

Time: 3 Hrs

Max Marks: 70

General Instructions:

- i. All questions are compulsory.
- ii. Questions 1 to 8 are very short answer type carrying 1 mark each. Answer them in one sentence each.
- iii. Questions 9 to 18 are short answer type carrying 2 marks each. Answer each of them in about 30 words.
- iv. Questions 19 to 27 are also short answer type carrying 3 marks each. Answer each of them in about 40 words.
- v. Questions 28, 29 & 30 are long answer type carrying 5 marks each. Answer each of them in about 70 words.
- vi. Calculators are not permitted. Use log tables if necessary.

- 1 How many octahedral and tetrahedral voids are present in a lattice of **N** atoms? 1
 - 2 How can you concentrate Galena (PbS) which contains some Zinc sulphide also? 1
 - 3 Why metal halides are found in sea water while metal sulphides and oxides are found in rocks? 1
 - 4 Arrange in the increasing order of acidic strength: H₂S, H₂O, H₂Se, H₂Te 1
 - 5 Why chloroform bottle should be air tight and kept away from sun light? 1
 - 6 Write the IUPAC name of C₆H₅-O-CH₂CH₂CH(CH₃)₂ 1
 - 7 Write one reaction of ethanal which illustrates the acidic property of α-hydrogen. 1
 - 8 Write an example of Rosenmund's reduction. 1
 - 9 If three elements X, Y and Z crystallize in a cubic lattice with X atoms at the corners, Y atom at the body centre and Z atoms at the edges of the cube, find the formula of the solid. 2
- OR
- Analysis shows that Wustite has formula Fe_{0.96}O_{1.00}. What fractions of iron exist as Fe²⁺ & Fe³⁺?
- 10 (i) State Raoult's law for a binary solution of volatile liquids. 2
 - (ii) Define Van't Hoff factor.
 - 11 (i) What are the constituents of "Charge" which is introduced into the blast furnace during iron extraction from haematite? 2
 - (ii) How does slag formation in the blast furnace help in the extraction of iron from haematite?
 - 12 (a) Cl₂ + 2 X⁻ → 2Cl⁻ + X₂; What can be X? 2
 - (b) What are the optimum conditions for maximum yield of SO₃ in Contact process?

- 13 Draw shapes of: 2
(i) Xe O F₄ (ii) S₈
- 14 (i) State the Saytzeff rule. 2
(ii) Why does benzyl chloride undergo alkaline hydrolysis while chlorobenzene cannot?
- 15 (i) Convert 2-bromo propane to 1-bromo propane. 2
(ii) What are enantiomers?
- 16 Answer about tert- butyl ethyl ether: Write reactions. 2
(i) How it is prepared by Williamson Synthesis?
(ii) What are the products obtained when it is treated with HBr?
- 17 Write the structure(s) of the major product(s) expected from: 2
(a) Mononitration of 3-methyl phenol (b) Dinitration of 3-methyl phenol
- 18 How do you distinguish between? 2
(i) Propiophenone and Acetophenone
(ii) Phenol and Benzyl alcohol
- 19 (i) Starting with Silicon how can you prepare n and p type semiconductor? 3
(ii) Differentiate between Schottky defect and Frenkel defect?
- 20 Tungsten (W) has density of 19.35 g cm⁻³ and the length of the edge of unit cell is 316 pm. If it forms bcc lattice, find number of atoms 50 g of tungsten contain. 3
 $N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$.
- 21 Give reasons: 3
(i) Soft drink bottles are sealed under high pressure.
(ii) Snow melts away when common salt is thrown on snowy roads of cold places.
(iii) Hypertensive people are advised to reduce the intake of salts in food. .
- 22 Explain the role of each of the following: 3
(i) CO in the extraction of Nickel
(ii) Zinc in the extraction of Silver
(iii) Silica in the extraction of copper
- 23 Give reasons: 3
(i) Unlike Phosphorus, nitrogen can form several oxides.
(ii) Noble gases are chemically inert.
(iii) IF₇ is the only inter halogen compound of X X₇ type.

- 24 Ozone layer is a protective umbrella for the earth system against the U.V radiations. Depletion of ozone layer is of deep concern now days. 3
- (a) Name two causes of ozone layer depletion.
 - (b) What modification is needed in our lifestyle to protect ozone layer?
 - (c) Why a silent electrical discharge is necessary during preparation of ozone from dioxygen?
 - (d) Why both oxygen – oxygen bonds in ozone are of equal length?
- 25 Write reactions for the preparation of: 3
- (i) Fluoro ethane by Swarts reaction
 - (ii) Toluene by Wurtz – Fittig reaction
 - (iii) Chlorobenzene by Sandmeyer reaction.
- 26 (i) Write IUPAC name of the product obtained by reaction of propanone with methyl magnesium bromide followed by hydrolysis. 3
- (ii) Arrange the following in the increasing order of boiling points:
Ethoxy ethane, Butan-1-ol, Butan-2ol, n- pentane, Butanal, Propanoic acid
- (iii) Explain how hydroxyl group activates benzene ring towards electrophiles.

OR

Accomplish the following conversions.

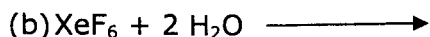
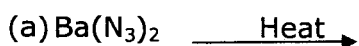
- (a) Salicylic acid to aspirin
 - (b) Phenol to benzoquinone
 - (c) Propene to propanol by hydroboration.
- 27 (a) Write mechanism of reaction between carbonyl compounds and ammonia derivatives. 3
- (b) Explain how the presence of EDG and EWG on alkyl chain influences the acidic strength of a carboxylic acid.
- 28 (a) A 5% solution of cane sugar (m.m = 342) is isotonic with a 0.877% solution of a substance X at 300K. Find the molar mass of X. 5
- (b) Menthol is a crystalline substance with peppermint taste. A 6.2% solution of menthol (w/w) in cyclohexane freezes at -1.95°C . Determine the formula mass of menthol. Freezing point of pure cyclohexane = 6.5°C ; $K_f = 20.2^{\circ}\text{C m}^{-1}$

OR

- (i) A solution prepared by dissolving 8.95 mg of gene fragment in 35 ml of water has an osmotic pressure of 0.35 mm of Hg at 25°C . Calculate its molar mass. $R = 0.082 \text{ L atm K}^{-1}\text{mol}^{-1}$.
- (ii) A binary solution of volatile liquids A and B has increased its boiling point after mixing. Explain the nature of this solution by using a vapour pressure diagram.

29 (i) Complete the following reactions:

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(ii) Answer the following:

(c) **A** & **B** are two bleaching agents for organic matter. Bleaching action of **A** is permanent while that of **B** is temporary. What could be **A** and **B**? Why do they act differently?

(d) A 3:1 mixture of **C** and **D** is called "Aqua regia". What are **C** and **D**? Write reaction when this solution dissolves gold.

(e) A chemical substance **E** is called "King of chemicals". It is a stronger oxidizing agent than H_3PO_4 but weaker than HNO_3 . Identify **E** and write its reaction with CaF_2 .

OR

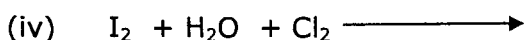
(a) Answer the following:

(i) A compound **X**, having rotten fish smell, is a weak base. It is used in producing smoke screen during an ambush and in *Holme's* signal. What is **X** and write its reaction with CuSO_4 .

(ii) A compound **Y** is used for *pickling of stainless steel*. It's hot and conc. solution evolves dense brown fumes with copper turnings. What is **Y** and write its reaction with Copper.

(iii) A compound **Z** is covalent in vapour phase but ionic in solid phase. It fumes in moist air. Identify **Z** and write its reaction with heavy water.

(b) Complete the following reactions:



30 (a) Starting with Phenyl magnesium bromide how you will prepare:

5

(i) Phenyl propanone (ii) Benzyl alcohol (iii) Benzoic acid

(b) How do you prepare acetyl chloride and acetic anhydride from acetic acid?

(c) Why carboxylic acids have higher boiling points than alcohols of comparable molecular masses?

OR

(a) Why methanal is more reactive than ethanal in nucleophilic addition reaction?

(b) How can you separate a mixture of aldehyde and ketone?

(b) Complete the following with suitable Reagent/Products.

