



**INDIAN SCHOOL SOHAR**  
**PRE BOARD EXAMINATION (2018 – 19)**  
**CHEMISTRY**

CLASS : XII

MAX. MARKS : 70

DATE : 13.01.2019

DURATION : 3.00 HRS

**General Instructions:**

- (a) All questions are compulsory.
- (b) Section A: Question numbers 1 to 5 very short answer questions carrying 1 mark each.
- (c) Section B: Question numbers 6 to 12 are short answer questions carrying 2 marks each.
- (d) Section C: Question numbers 13 to 24 are also short answer questions carrying 3 marks each.
- (e) Section D: Question numbers 25 and 27 are long answer questions carrying 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 log tables, if necessary, Use of calculator is not allowed.

**Section - A**

1. What is the formula of a compound in which element 'P' form ccp and atoms 'Q' occupy  $\frac{2}{3}$ <sup>rd</sup> of tetrahedral voids?

OR

Why FeO(s) has non-stoichiometric composition?

2. What is the type of charge on AgI colloidal sol formed when AgNO<sub>3</sub> solution is added to KI solution?
3. Give the IUPAC name of the following compound: [Co(NH<sub>3</sub>)<sub>5</sub>Cl]SO<sub>4</sub>

OR

Write the formula of the following compound: Diamminechloridonitrito-N-platinum(II)

4. Give reasons: S<sub>N</sub>1 reactions are accompanied by racemisation in optically active alkyl halides.
5. Name a monomer which on polymerisation gives neoprene.

**Section - B**

6. Vapour pressure of water at 20°C is 17.5 mmHg. Calculate the vapour pressure of water at 20°C when 15 g of glucose (Molar mass 180 gmol<sup>-1</sup>) is dissolved in 150 g of water.

OR

Calculate the molality of ethanol solution in which the mole fraction of water is 0.88.

7. Give reasons:
  - (i) Benzaldehyde does not undergo aldol condensation.
  - (ii) Sodium bisulphite is used to separate carbonyl group compound from non-carbonyl compounds.

OR

Write the reactions involved in the following:

- (i) Etard reaction
- (ii) Stephen's Reaction

8. Write the structures of the monomers used in getting the following polymers:

- (i) Nylon 6,6
- (ii) Dacron

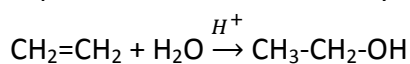
9. Give a simple test to distinguish between the following pair of compounds.

- (i) Ethanol and phenol
- (ii) Propanol and 2-methylpropan-2-ol

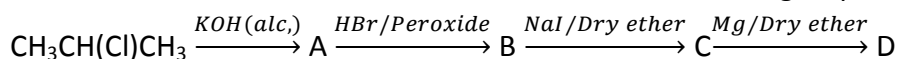
10. State the role of activated complex in a reaction and state its relation with activation energy.
11. Answer the following:
- Reducing character decreases from  $\text{SO}_2$  to  $\text{TeO}_2$ .
  - Xe forms compounds with  $\text{F}_2$  and  $\text{O}_2$  only.
12. Complete the following chemical reaction equations:
- $\text{MnO}_4^- (\text{aq}) + \text{C}_2\text{O}_4^{2-} (\text{aq}) + \text{H}^+ (\text{aq}) \rightarrow$
  - $\text{Cr}_2\text{O}_7^{2-} (\text{aq}) + \text{Fe}^{2+} (\text{aq}) + \text{H}^+ (\text{aq}) \rightarrow$

### Section -C

13. An element exist as bcc lattice with cell edge 288 pm. Calculate the molar mass if its density is  $7.2 \text{ g cm}^{-3}$ .
14. Calculate the van't Hoff factor for each of the following:
- 50% ionised  $\text{K}_4[\text{Fe}(\text{CN})_6]$
  - 60% ionised  $\text{CaCl}_2$
  - Benzoic acid which is 50% dimerised in benzene.
15. Explain the mechanism for hydration of acid catalysed ethene:



16. Write the structural formula of A, B, C and D in the following sequence of reaction



OR

How will you convert the following:

- Prop-1-ene to 1-Fluoropropane
  - Ethanol to propanenitrile
  - Bromoethane to butane
17. A Carboxylic compound 'A' ( $\text{C}_2\text{H}_6\text{O}$ ) on oxidation with PCC gave 'B' where on treatment with aq. Alkali and subsequent heating gave 'C'. 'B' on oxidation with  $\text{KMnO}_4$  gives a mono basic carboxylic acid with molar mass  $60 \text{ g mol}^{-1}$ . Deduce structures of A, B, C and write the reactions involved.
18. Answer the following:
- Which one of the following drug is antibiotic?  
Morphine, Equanil, Chloramphenicol, Aspirin
  - What is meant by chemotherapy?
  - Why is bithional added to soap?
19.
  - Which vitamin deficiency causes rickets?
  - Name the base that is found in nucleotide of RNA only.
  - Glucose on reaction with acetic acid gives glucose pentaacetate. What does it suggest about the structure of glucose?

OR

What is denaturation of proteins? Give an example.

Why are enzymes called biocatalysts?

20. For a chemical reaction the energy of activation is  $85 \text{ kJ mol}^{-1}$ . If the frequency factor is  $4.0 \times 10^9 \text{ L mol}^{-1} \text{ s}^{-1}$ , what is the rate constant at 400 K? ( Gas Constant  $R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$ )

OR

The data below are for the reaction of  $\text{NO}$  and  $\text{Cl}_2$  to form  $\text{NOCl}$  at 295 K.

Exp. No.	$[\text{Cl}_2] (\text{mol L}^{-1})$	$[\text{NO}] (\text{mol L}^{-1})$	Initial Rate ( $\text{mol L}^{-1} \text{ s}^{-1}$ )
1	0.05	0.05	$1.0 \times 10^{-3}$

2	0.15	0.05	$3.0 \times 10^{-3}$
3	0.05	0.15	$9.0 \times 10^{-3}$

- (i) What is the order with respect to NO and Cl<sub>2</sub> in the reaction?  
(ii) Calculate the rate constant.  
(iii) Determine the reaction rate when concentrations of Cl<sub>2</sub> and NO are 0.2 M and 0.4M respectively.
21. Write one difference in each of the following:  
(i) Solution and colloid (ii) Coagulation and peptisation (iii) Adsorption and absorption
22. (i) Write the principle involved in the following:  
(a) Zone refining (b) Electrolytic refining  
(ii) Name the metal refined by following process:  
(a) Mond's Process (b) van Arkel method

OR

Write the principle of vapour phase refining.

What is role of depressant in froth floatation process?

Write the name of reducing agent to obtain iron from Fe<sub>2</sub>O<sub>3</sub> at high temperature.

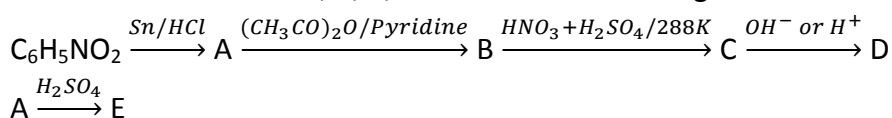
23. Explain the following observation:  
(i) The enthalpies of atomisation of transition metals are quite high.  
(ii) There is a close similarity in physical and chemical properties of the 4d and 5d series of the transition elements, much more than expected on the basis of usual family relationship.  
(iii) The members in the actinoid series exhibit larger number of oxidation states than the corresponding members in the lanthanoid series.
24. When a coordination compound CrCl<sub>3</sub>.6H<sub>2</sub>O is mixed with AgNO<sub>3</sub> solution, 3 moles of AgCl are precipitated per mole of the compound. Write  
(i) Structural formula of the complex  
(ii) IUPAC name of the complex  
(iii) Magnetic and spin property of complex

**Section -D**

25. An organic compound 'A' with molecular formula C<sub>6</sub>H<sub>7</sub>N is sparingly soluble in water. 'A' on treatment with dil. HCl it gives a water soluble compound 'B'. 'A' also reacts with CHCl<sub>3</sub> in presence of alcoholic KOH to form an obnoxious smelling compound 'C'. 'A' reacts with benzene sulphonyl chloride to form alkali soluble compound 'D'. 'A' reacts with NaNO<sub>2</sub> and conc. HCl at 0-5<sup>o</sup>C to form 'E' which on reaction with phenol forms an orange red dye 'F'. Elucidate the structure of organic compounds 'A' to 'F'.

OR

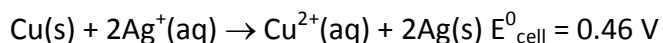
Write the structure of A, B, C, D and E in the following reactions:



26. (a) Represent the cell in which the following reaction takes place:  
 $\text{Mg(s)} + 2\text{Ag}^+(0.0001\text{M}) \rightarrow \text{Mg}^{2+}(0.130\text{M}) + 2\text{Ag(s)}$   
Calculate its E<sub>(cell)</sub> if E<sup>o</sup><sub>cell</sub> = 3.17V.  
(b) The electrical resistance of a column of 0.05 molL<sup>-1</sup> NaOH solution of diameter 1 cm and length 50 cm is 5.55 x 10<sup>3</sup> ohm. Calculate its resistivity, conductivity and molar conductivity.

OR

(a) Calculate the equilibrium constant of the reaction:



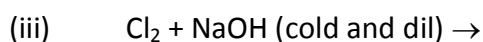
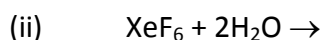
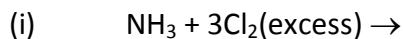
(b) If a current of 0.5 ampere flows through a metallic wire for 2 hours, then how many electrons would flow through the wire? ( $1\text{F} = 96500 \text{ C}$ ; Charge of one electron =  $1.6 \times 10^{-19} \text{ C}$ )

27. When conc.  $\text{H}_2\text{SO}_4$  was added to unknown salt present in a test tube, a brown gas 'A' was evolved. 'A' gas intensified when copper turnings were added in this test tube. On cooling the gas 'A' is changes into colourless solid 'B'. Identify 'A' and 'B'. Write the chemical reactions involved.

Draw the structure of  $\text{XeOF}_4$

OR

Complete the following reactions:



Draw the structure of the following:

