

FIRST MODELEXAMINATION DECEMBER- 2018-19

CHEMISTRY

Class XII

PAPER- 1 [THEORY]

TIME: 3 HRS

MARKS: 70

[Candidates are allowed additional 15 minutes for only reading the paper.

They must not start writing during this time]

ALL QUESTIONS ARE COMPULSORY

QUESTION 1 is of 20 marks all of which are compulsory

QUESTION numbers from 2 to 8 is of two marks each.

QUESTION numbers from 9 to 15 is of three marks each.

QUESTION numbers from 16 to 18 is of five marks each.

All working including rough work should be done on the same sheet as and adjacent to the rest of the answer. The intended marks for questions are given in brackets []. Balanced equation must be given wherever possible and diagrams where they are helpful. When solving numerical problems all essential working must be shown. For solving numericals the following data can be used

1 Faraday = 96500 coulombs , $h = 6.626 \times 10^{-34} \text{Kgm}^2\text{s}^{-1}$,

$R=8.314\text{J/K/mol}$, 0.0821Latm/K/mol , 0.083Lbar/K/mol , 1.987 cal/K/mol

avogadros number= 6.022×10^{23}

QUESTION -1

(a) Fill in the blanks:

- (i) Phenol gives ----- coloured dye on reaction with benzene diazonium chloride at $0^{\circ}\text{C} - 5^{\circ}\text{C}$. This is known as----- test

- (ii) BHA and BHT are added as ----- in food while sodium benzoate as-----.
- (iii) In a galvanic cell the movement of electrons is from ----- to----- in the external circuit.
- (iv) Copper crystal has ----- structure with coordination number-----

(b) Choose the correct alternatives;

- (i) When acetone is treated with grignards reagent followed by hydrolysis the product formed is

(a) 1^o alcohol (b) 2^o alcohol (c) 3^o alcohol (d) ether

- (ii) Which of the following haloalkanes has the highest boiling point .

(a) (CH₃)₃CCl (b) CH₃CH₂CH₂CH₂Cl
(c) CH₃CH(CH₃)CH₂Cl (d) CH₃CH₂CH₂Cl

- (iii) Which of the following metals is purified by Van Arkel process?

(a) $4r/\sqrt{3}$ (b) $4r/\sqrt{2}$ (c) $\sqrt{3}r/2$ (d) $2r$

(C) Match the following:

(i) Polysaccharide

dsp^2

(ii) One mole of electrons

starch

(iii) Teflon

one faraday

(iv) Square planar

addition polymer

(d) Answer the following:

- (i) Explain why:

(a) Transition metals form alloys

(b) La(OH)₃ is more basic than Lu(OH)₃

- (ii) Write balanced chemical equation for:

(a) Carbylamine reaction

(b) Gabriel phthalimide reaction

- (iii) (a) The depression in freezing point caused by 1M K₂SO₄ is 0.075^oC.

What is the depression in freezing point caused by 1M urea

(b) Explain why fluorine doesnot play the role of central atom in interhalogen compound

- (iv) Briefly explain adsorption theory of catalysis

QUESTION-7

How is phenol converted to salicylaldehyde? Write the balanced Chemical equation for it and name this reaction. Give a chemical test to distinguish between phenol and ethanol

[OR]

Write the mechanism of dehydration of ethanol in presence of Concentrated sulphuric acid at 170°C

QUESTION - 8

- (a) Differentiate between an antipyretic and an analgesic
- (b) Name a biodegradable detergent . Also mention the superiority of detergent over soap.

QUESTION – 9

Explain

- (a) Nitrogen is gas whereas phosphorus is solid at room temperature
- (b) HOCl has greater acid strength than HOI
- (c) H_3PO_3 is a diprotic acid

[OR]

- (a) Draw the structure of XeO_3 . What is its hybridization
- (b) Fluorine forms only one oxoacid. Why?

QUESTION-10

- (a) Define pyroelectricity
- (b) KF has NaCl structure. If the distance between K^+ and F^- is 269 pm. Find the density of KF [atomic mass of K = 39 U, F = 19U]

PART- II

QUESTION -2

The resistance of a conductivity cell containing 0.001 M KCl solution at 298 K is 1500 ohms. What is the cell constant if the conductivity of 0.001 M KCl solution at 298 K is $0.146 \times 10^{-3} \text{ Scm}^{-1}$

QUESTION-3

Write the names and structures of the monomers of the following polymer:

(a) Nylon – 6, 6

(b) Buna –S

QUESTION-4

How will you bring about the following conversions:

(i) Chlorobenzene to phenol

(ii) Acetone to iodoform

QUESTION - 5

Calculate the boiling point of solution containing 0.61 g of benzoic acid in 5 g of carbon di sulphide assuming 84% dimerization of the acid. The boiling point and K_b of carbon di sulphide are 46.2°C and 2.3 K Kg/ mol

QUESTION-6

The first order rate constant for the decomposition of ethyl iodide by the reaction at 600K

$\text{C}_2\text{H}_5\text{I}(\text{g}) \longrightarrow \text{C}_2\text{H}_4(\text{g}) + \text{HI}(\text{g})$ is $1.6 \times 10^{-5} \text{ S}^{-1}$. Its energy of activation is 209 KJ/mol Calculate the rate constant of the reaction at 700 K

QUESTION – 11

Write down the formulae of the following compounds:

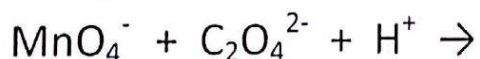
- (i) Potassium penta cyano nitrosyl cobaltate(III)
- (ii) Ferric hexa cyano ferrate(II)
- (iii) Sodium trioxalato ferrate (III)

QUESTION – 12

- (a) State Hardy Schulze rule
- (b) Explain why:
 - (i) Medicines are more effective in colloidal form
 - (ii) Gelatin is added to ice cream

QUESTION – 13

- (a) Give reasons for the following :
 - (i) Transition metals form complexes
 - (ii) Cr^{2+} is a strong reducing agent.
- (b) Complete and balance the equation:



[OR]

- (a) Describe the preparation of potassium dichromate from chromite ore. With chemical equations involved.
- (b) Complete and balance the following equation:



QUESTION – 14

Convert the following:

- (a) Benzamide to toluene
- (b) Aniline to benzoic acid
- (c) Benzoic acid to nitro benzene

QUESTION -15

- (a) Describe the steps involved in the extraction of silver from its ore. Give relevant equations. Mention the ores of silver.
- (b) ZnO can be reduced to the metal by heating with carbon but not Cr_2O_3 . Give suitable reasons for the same.

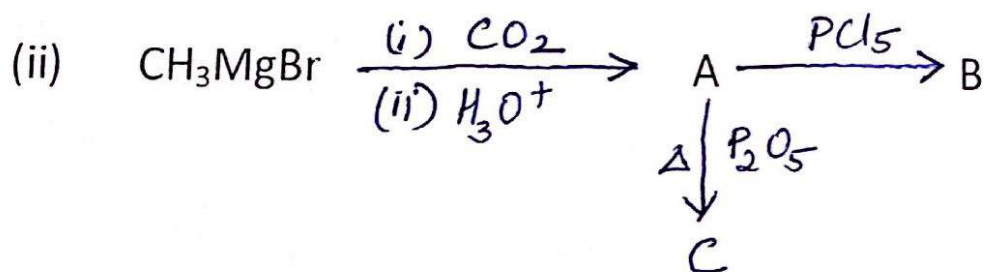
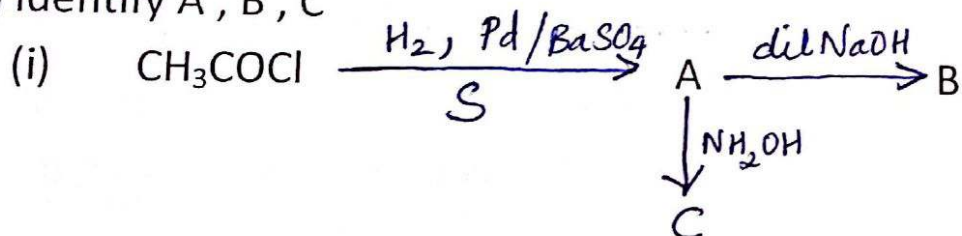
QUESTION - 16

- (a) Two metals A and B have reduction potential values -0.76V and $+0.34\text{V}$ respectively. Which of these will liberate hydrogen from dilute sulphuric acid.
- (b) Name a cell which was used in Apollo space programme.
- (c) For a cell $\text{Mg}_{(s)} / \text{Mg}^{2+}_{(aq)} // \text{Ag}^{+}_{(aq)} / \text{Ag}_{(s)}$ Calculate the equilibrium constant at 25°C . Also calculate the maximum work that can be obtained by operating the cell

$$E^{\circ}_{\text{Mg}^{2+}/\text{Mg}} = -2.37\text{V} \quad E^{\circ}_{\text{Ag}^+/\text{Ag}} = +0.80\text{V}$$

QUESTION - 17

- (a) Identify A, B, C



- (b) Give a chemical test to distinguish between

- (i) Acetic acid and benzoic acid
(ii) Acetaldehyde and benzaldehyde

QUESTION – 18

(i) Give reasons for the following :

(a) Fluorine exhibits only -1 oxidation state but other halogens exhibit +1, +3, +5 states why?

(b) PCl_3 fumes in moist air

(c) Ammonia has higher boiling point than phosphine

(ii) Give balanced equation for the following :

(a) Chlorine with hot concentrated sodium hydroxide solution

(b) Excess ammonia with chlorine

[OR]

(a) Explain why

(i) The acid strength of HI is more than HF

(ii) In solid state PCl_5 behaves as an ionic species.

(b) Give balanced equation for the following :

(i) Ozone with moist KI

(ii) White phosphorus on heating with concentrated NaOH

(iii) Moist sulphur dioxide with acidified KMnO_4