

MAR THOMA RESIDENTIAL SCHOOL TIRUVALLA
SECOND MODELE XAMINATION JANUARY- 2019

CHEMISTRY

PAPER- 1 [THEORY]

TIME: 3 HRS

Marks :70

STD XII

[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 or 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 , 1.987cal/K/mol

avogadros number= 6.022×10^{23}

QUESTION -1

(a) Fill in the blanks:

[4]

- (i) Phenol is ----- because of ----- stabilization of its conjugate base.
(ii) During bessemerisation ----- and ----- react to form metallic copper.

- (iii) F centre is responsible for ----- and ----- behaviour of the solid.
 (iv) In an electrolytic cell ----- energy is converted to ----- energy.

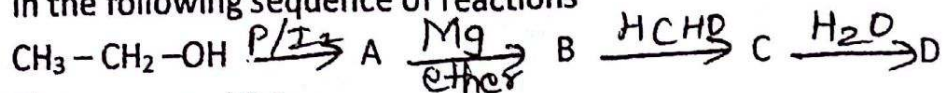
(b) Choose the correct alternative:

[4]

(i) Which among the following reacts fastest of S_N2 reaction

- (a) $(CH_3)_3C-Br$ (b) $(CH_3)_2CHBr$ (c) CH_3CH_2Br (d) CH_3Br

(ii) In the following sequence of reactions



The compound D is

- (a) Propanal (b) butanal (c) n-butyl alcohol (d) n-propyl alcohol
 (iii) Which of the following has the highest boiling point
 (a) 0.1M KCl (b) 0.1 M K_2SO_4 (c) 0.1 M urea (d) 0.1 M $K_4[Fe(CN)_6]$
 (iv) In a compound atoms of element Y forms CCP lattice and those of element X occupy $2/3^{rd}$ of tetrahedral voids. The formula of the compound will be
 (i) X_2Y (ii) X_3Y_4 (iii) X_4Y_3 (iv) X_2Y_3

(c) Match the following:

[4]

- | | |
|----------------------------|------------------|
| (i) Vitamin C | Isoprene |
| (ii) Valence bond theory | Electric signals |
| (iii) Natural rubber | Linus pauling |
| (iv) Piezoelectric signals | Ascorbic acid |

(d) Answer the following:

[8]

- (i) Define autocatalysis and give a suitable example
 (ii) Explain the term coagulation of a colloid. Mention two ways by which it can be done
 (iii) Write balanced chemical equations for Balz – Schiemann and Stephens' reduction
 (iv) What is meant by lanthanoid contraction? Why is actinoid contraction is greater than that of lanthanoid contraction

PART-II

[ANSWER ALL THE QUESTIONS]

QUESTION -2

Mention the name and structure of the monomers of

- (i) Bakelite (ii) Dacron

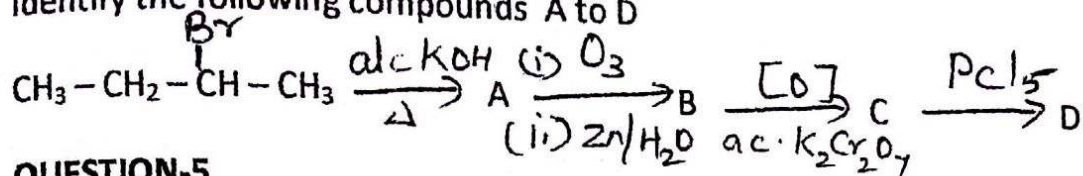
QUESTION - 3

- (i) Write the difference between fibrous protein and globular protein

(ii) Give a chemical test to distinguish between glucose and fructose

QUESTION -4

Identify the following compounds A to D

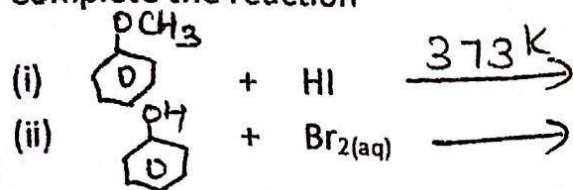


QUESTION-5

How is phenol converted to benzoic acid? Explain with the help of balanced equation

[OR]

Complete the reaction



QUESTION - 6

What mass of ethylene glycol (molar mass 62 g/ mol) must be added 5.50kg of water to lower the freezing point of water from 0°C to -10°C [K_F for water is 1.86 K Kg/mol]

QUESTION -7

The half life for radioactive decay of C- 14 is 5730years.An archaeological artifact

Contained wood that had only 80 % of C-14 found in the living tree.Estimate the age of

The sample

QUESTION - 8

The conductivity of 0.00247 M acetic acid is $7.896 \times 10^{-5} \text{ Scm}^{-1}$. Calculate its molar

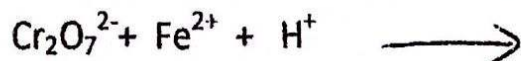
Conductivity and dissociation constant if λ_m^0 for acetic acid is $390.5 \text{ Scm}^2 \text{ mol}^{-1}$

QUESTION -9

(a) Explain why

- (i) The enthalpies of atomization of the transition elements are quite high
- (ii) Transition metals form complex compound

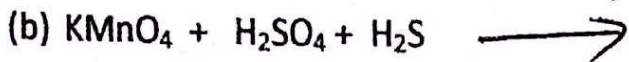
(b) Complete the following chemical equation and balance it



[OR]

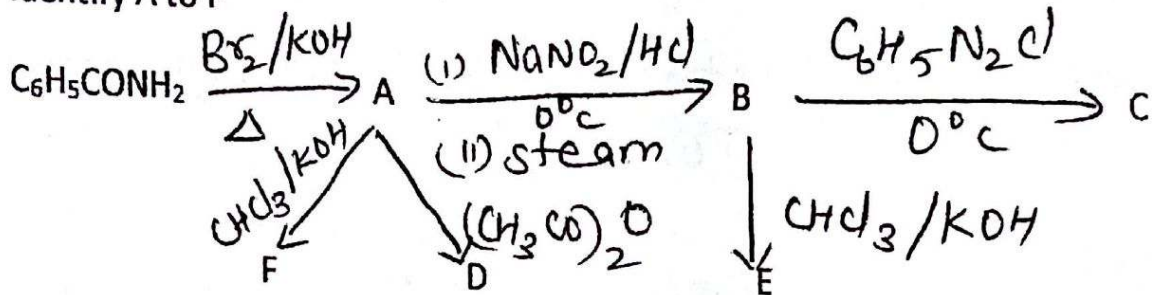
(a) Account for the following:

- Cuprous chloride is colourless but cupric chloride is coloured
- Transition metals forms alloys



QUESTION -10

Identify A to F



QUESTION - 11

- What is the difference between dilute detergent solution and concentrated soap solution
- What happens when FeCl_3 is added to freshly prepared $\text{Fe}(\text{OH})_3$ precipitate. Name the process
- Explain why physisorption decrease with increase in temperature

QUESTION - 12

- Give two difference between double salt and coordination compounds
- What type of isomerism is shown by $[\text{Co}(\text{NH}_3)_5\text{Br}] \text{SO}_4$ and $[\text{Co}(\text{NH}_3)_5\text{SO}_4]\text{Br}$
How can you distinguish between these two isomers

QUESTION- 13

- Is ferromagnetic or ferromagnetic substance a better permanent magnet. Justify
- Define coordination number
- Give two difference between schottky and frenkel defect

QUESTION -14

Explain why:

- HClO_4 has greater acid strength than HOCl
- Halogens are coloured

QUESTION – 15

- (a) Give the formulae of the following compounds:
- Potassium tetrafluorido borate (III)
 - Mercuric tetrathiocyanatocobaltate (II)
- (b) Predict the hybridization and geometry of the central atom in $[\text{Co}(\text{NH}_3)_6]^{3+}$

QUESTION -16

- (a) A voltaic cell is set up at 25°C with the following half cells
 $\text{Al} / \text{Al}^{3+} (0.0010\text{M}) // \text{Ni} / \text{Ni}^{2+} (0.50\text{M})$
Write the equation for the cell reaction that occurs when the cell generates an electric current and determine the cell potential. $E^\circ_{\text{Ni}^{2+}/\text{Ni}} = -0.25\text{V}$, $E^\circ_{\text{Al}^{3+}/\text{Al}} = -1.66\text{V}$
- (b) What type of cell is a lead storage battery? Write the anode and cathode reactions and the overall cell reaction occurring in the use of lead storage battery

QUESTION – 17

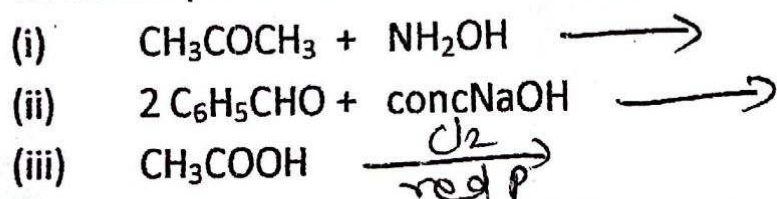
- (a) Give the shape and hybridization of ClF_3 and XeO_2F_2
- (b) Explain why
- Sulphur exhibits paramagnetism in vapour state
 - Oxide of fluorine is written as OF_2 and not F_2O
- (c) Draw the structure of oleum

[OR]

- (a) Give balanced equation for the following:
- Copper with dilute nitric acid
 - Ammonia with hot copper(II) oxide
 - Oxalic acid with concentrated sulphuric acid
- (b) What is the hybridization and geometry of XeF_4 and IF_7

QUESTION – 18

- (a) Write the products for the following reactions:



- (b) Give one chemical test for the following:

- Benzaldehyde and Benzoic acid
- Propanal and Propanone

[OR]

(a) Write the chemical equations to illustrate the following name reactions:

- (i) Wolf – Kishners reduction
- (ii) Scotten – Baumann reaction
- (iii) Gattermanns reaction

(b) Account for the following:

- (i) Carboxylic acids are stronger acids than phenol .
- (ii) Aniline doesnot undergo direct nitration.