

MAR THOMA RESIDENTIAL SCHOOL TIRUVALLA
SECOND TERMINAL EXAMINATION DECEMBER- 2018-19
CHEMISTRY
PAPER- 1

CLASS : XI

[MAXIMUM MARKS: 70]
[TIME ALLOWED: THREE HOURS]

[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 , $h = 6.626 \times 10^{-34} \text{ Kg m}^2 \text{ s}^{-1}$,

$R = 8.314 \text{ J/K/mol}$, $0.0821 \text{ Latm/K/mol}$, $0.0831 \text{ Lbar/K/mol}$, 1.987 cal/K/mol

avogadros number = 6.022×10^{23}

QUESTION -1

(a) Fill in the blanks:

[4]

- (i) Acetic acid is ----- acidic than formic acid due to ----- effect.
- (ii) Reductive ozonolysis of 2- methyl propene shall give ----- and ---
- (iii) The hybridization and geometry of PCl_5 is ----- and -----
- (iv) A real gas behaves like an ideal gas at ----- pressure and ----- Temperature.

(b) Choose the correct alternative:

[4]

- (i) $\text{S}_{\text{N}}1$ reaction is faster in
 - (a) 2- chloro propane
 - (b) 2 – chloro – 2- methyl propane
 - (c) 1 – chloro propane
 - (d) Chloro methane
- (ii) Baeyers reagent is
 - (a) Alkaline potassium permanganate
 - (b) Acidified potassium permanganate
 - (c) Neutral potassium permanganate
 - (d) Aqueous bromine solution

- (iii) Hydrogen bonding is not present in
- glycerine
 - Water
 - Hydrogensulphide
 - Hydrogen fluoride
- (iv) Which of the following involves absorption of energy
- $\text{Cl} + e^- \longrightarrow \text{Cl}^-$
 - $\text{O} + e^- \longrightarrow \text{O}^{2-}$
 - $\text{O} + e^- \longrightarrow \text{O}^-$
 - $\text{S} + e^- \longrightarrow \text{S}^-$

(c) Match the following :

- Nitrobenzene
- London force
- Aniline
- Keesom force

Hydrogen fluoride [4]
 ortho – para directing effect
 meta – directing effect
 noble gas

(d) Answer the following :

- State (a) Markownikoffs rule (b) Kharasch effect [8]
- 127 ml of a certain gas diffuse in the same time as 100 ml of chlorine under the same conditions. Calculate the molar mass of the gas. State the law behind this. [Cl = 35.5 u]
- Calculate the total pressure in a 10 litre cylinder which contains 0.4 grams of helium, 1.6 grams of oxygen and 1.4 grams of nitrogen at 27°C. Also calculate the partial pressure of helium gas in the cylinder Assuming ideal behaviour for gases. [He = 4u O = 16u N = 14u]
- Explain :
 - Benzene under goes substitution reaction easily than addition.
 - Alkenes have higher melting point than alkane.

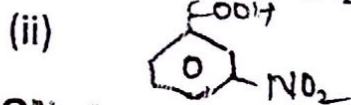
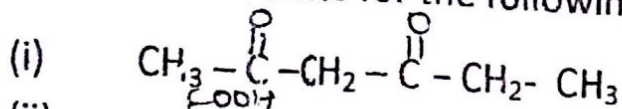
QUESTION - 2

Write balanced chemical equation for the following :

- 2 – methyl propene treated with hot and concentrated KMnO_4 solution
- Ethene treated with cold and dilute alkaline KMnO_4 solution.

QUESTION - 3

Write IUPAC names for the following :



QUESTION - 4

Draw the structures for the following IUPAC names:

- (i) 2-cyano-3-oxooct-5-en-1-amide
(ii) 2, 4, 6-trinitrotoluene

QUESTION - 5

Give reasons for the following :

- (i) PCl_5 exist but NCl_5 does not.
(ii) AgI is more covalent in character than AgCl

QUESTION - 6

Balance the following equation in acidic medium



QUESTION - 7

- (a) State VSEPR theory
(b) Give two difference between sigma and pi bond

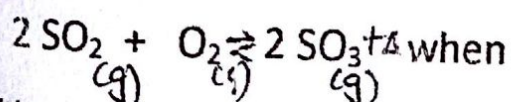
QUESTION - 8

Explain why:

- (i) Noble gases have positive values for electron affinity
(ii) Along a particular period noble gases have highest atomic radius.

QUESTION - 9

State Le chatliers principle. What happens to this equilibrium



- (i) Temperature is increased (ii) pressure is increased
(iii) Inert gas is added at constant pressure (iv) inert gas is added at constant volume

QUESTION - 10

- (i) Define RMS velocity
- (ii) It is desired to increase the volume of a gas by 20%, without changing the pressure. To what temperature the gas must be heated if initial temperature the gas is 27°C. State the law.

QUESTION - 11

Convert the following :

- (a) Phenol to chlorobenzene
- (b) Methane to ethane
- (c) Ethyne to ethane

QUESTION - 12

- (a) What is acid rain? Write its effects. What are the measures to control?
- (b) What is green chemistry? Write one achievement of green chemistry and its application in daily life.

QUESTION - 13

- (a) Classify the following into type of reaction and type of reagent
 - (i) Benzene + conc. Nitric acid $\xrightarrow{\text{conc. H}_2\text{SO}_4}$
 - (ii) Methane + chlorine $\xrightarrow{\text{sunlight}}$
- (b) Write differences between inductive effect and mesomeric effect

QUESTION - 14

Write balanced chemical equations for the following reaction:

- (i) Wurtz reaction
- (ii) Corey – House reaction
- (iii) Kolbes electrolytic reaction

QUESTION - 15

- (a) Give a chemical test to distinguish between:
 - (i) Ethane and Ethene
 - (ii) Ethene and Ethyne
- (b) Write two uses of benzene

QUESTION – 16

- How will you convert acetylene to but-2-yne?
- Which is the major product obtained when 2-bromobutane is treated with alcoholic KOH? State the rule involved.
- Draw the resonating structures of phenol and explain its directive influences.

QUESTION – 17

- What are the faulty postulates of kinetic theory pointed out by van der Waals?
- What is the density of sulphur dioxide gas at 27°C and 2 atmospheric pressure [S = 32u, O = 16u]?
- For the reaction $A_{(g)} + B_{(s)} \rightleftharpoons C_{(g)} + D_{(g)}$, $K_c = 49 \text{ mol/dm}^3$ at 127°C . Calculate K_p .

QUESTION - 18

- Write the balanced chemical equation for Friedel-Crafts alkylation.
- Identify the compounds A and B:
 - $\text{C}_6\text{H}_5\text{COONa} + \text{NaOH} \xrightarrow[\Delta]{\text{CaO}}$ A $\xrightarrow[\text{C.H}_2\text{SO}_4]{\text{C.HNO}_3}$ B
 - $\text{CH}_3 - \text{C} \equiv \text{C} - \text{CH}_3 \xrightarrow{\text{O}_3}$ A $\xrightarrow[\text{Zn/H}_2\text{O}]{\text{Zn/H}_2\text{O}}$ B
- An alkene X gave ethanal and acetone on reductive ozonolysis. Find the structure of X and give the IUPAC name.