MAR THOMA RESIDENTIAL SCHOOL TIRUVALLA

FIRST TERMINAL EXAMINATION AUGUST- 2019- 20

CHEMISTRY

CLASS: XII

TIME: 3 HR

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 or must be shown. For solving numericals the following data can be used

1 Faraday = 96500 coulombs ,avogadros number=6.022×10^{23},

R= 8.314J/K/mol,1.987 cal/K/mol ,0.0821Latm/K/mol,0.083 Lbar/K/mol

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QUESTION - 1

(a) Fill in the blanks: [4]

(i) Ethyl amine is ---------- basic than ammonia due to ----------

(ii) When benzaldehyde reacts with---------- it forms---------- and $POCl_3$

(iii) ---------- solutions obey Raoults law and do not form----------

(iv) K_2HgI_4 produces brown precipitate when treated with---------- salts which confirms the presence of ---------- ions

(b) Match the following: [4]

(i)	Phenol + $CHCl_3$ +NaOH/	Anisotropic
(ii)	Glass	Carbylamine reaction
(iii)	Aniline + $CHCl_3$+ KOH	Isotropic
(iv)	Graphite	Reimer – Tiemann reaction

(C) Choose the correct alternative: [4]

(i) In the following series of reaction

$A \xrightarrow{\text{Reduction}} B \xrightarrow{HNO_2} C_2H_5OH$

(a) CH_3CN (b) CH_3NC (c) C_2H_5NC (d) CH_3NO_2

(ii) The oxidation of toluene to benzaldehyde with chromyl chloride in Carbontetrachloride is called

(a) Sandmeyers reaction (b) Perkins reaction (c) Fittigs reaction (d)Etards reaction

(iii) Which of the following 0.10M aqueous solution will have lowest Freezing point

(a) KI (b) $BaCl_2$ (c) $Al_2(SO_4)_3$ (d) $C_6H_{12}O_6$

(iv) A solid has a structure in which W atoms are located at the corners of Cubic lattice, O atoms at the centre of edges and Na atom at the Centre of the cube . The formula of the compound is

(a) $NaWO_2$ (b) $NaWO_3$ (c) Na_3WO_3 (d) $NaWO_4$

(d) Answer the following: [8]

(i) Write the balanced chemical equation for the preparation of salicylic acid. Also write its application

(ii) Give the balanced chemical equation for the preparation of DDT Write its use a demerit

(iii) Predict the hybridization and geometry of central metal atom/ion In $[Ni(CO)_4]$ and $[Cr(CN)_6]^{3-}$

(iv) State Henrys law. The mole fraction of helium in a saturated solution At 25^0C is $1.2x10^{-6}$.Find the pressure of helium above the solution Henrys constant at 20^0C is 144.97Kbar

QUESTION – 2

What are the conditions necessary for the colliding molecules to yield Products.

QUESTION – 3

What is activation energy? How can it be calculated graphically

QUESTION – 4

0.85% aqueous solution of sodium nitrate is 90% dissociated at 27^0C

Calculate its osmotic pressure

QUESTION -5

Convert the following :

(i) Benzoic acid to benzamide
(ii) Phenol to anisole

QUESTION – 6

Identify the compound from A to D

$$C_2H_5OH \xrightarrow{PCl_5} A \xrightarrow{KCN} B \xrightarrow{H_3O^+} C \xrightarrow[\Delta]{NH_3} D$$

QUESTION- 7

Give chemical test to distinguish between:

(i) Acetaldehyde and benzaldehyde (ii) Phenol and benzoic acid

QUESTION -8

Arrange the following in increasing order of basicity and explain the property which decides this order

$(C_2H_5)_3N$, NH_3 , $C_2H_5NH_2$,$(C_2H_5)_2NH$

QUESTION – 9

Write balanced chemical equation for

(a) Hoffmanns bromamide reaction
(b) Stephens reduction
(c) Perkins reaction

QUESTION – 10

Convert the following:

(i) Acetic acid to formic acid
(ii) Acetaldehyde to acetone
(iii) Ethanol to propanol

QUESTION – 11

Give balanced equation for the following:

(i) Acetic acid treated with chlorine in presence of red phosphorus at 423 K
(ii) Benzaldehyde treated with concentrated HNO_3 and conc H_2SO_4
(iii) Chlorobenzene heated with sodium in dry ether

QUESTION – 12

Compound A having the molecular formula C_2H_7N on treatment with nitrous acid gave a compound B having molecular formula C_2H_6O . The compound B on treatment with acetyl chloride gave a compound C having molecular formula $C_4H_8O_2$.

(i) Name the compounds A, B and C. Write their structural formula
(ii) Write the balanced equations for the formation of B and C

QUESTION – 13

An element has BCC structure with edge length 288 pm. The density of the element is 7.2 g/cm^3.How many atoms are present in 208 gram of the element

QUESTION – 14

The vapour pressure of pure liquid A and B are 450 mm Hg and 700 mm Hg at 350K respectively. Find out the composition of the liquid mixture if total vapourpresure is 600mm Hg .Also find the composition of A and B in vapour phase in terms of mole fraction.

QUESTION -15

In the Arrhenius equation for a certain reaction the value of A and E_a are 4×10^{13} sec^{-1} and 98.6 KJ/mol. If the reaction is of first order at what temperature will its half life period be 10 minutes .

QUESTION-16

(a) Draw the isomers of the complex ion $[Co(en)_2Cl_2]^{2+}$

(b) Write the IUPAC name for $[Cr(NH_3)_4Cl_2]^+$

(c) Explain why

(i) $[Co(CN)_6]^{3-}$ and $[CoF_6]^{3-}$ differ from each other

(ii) $[Ti(H_2O)_6]^{3+}$ is coloured [Z of Ti is 22]while $[Sc(H_2O)_6]^{3+}$ is colourless [Z of Sc is 21]

QUESTION – 17

(a) The vapour pressure of water is 12.3 KPa at 300 K. Calculate the vapour pressure of one molal solution of solute in it

(b) Calculate the boiling point of one molar aqueous solution of KCl whose density is 1.04 g/ml . K_b for water is 0.52 KKg/mol

[atomic mass of K =39, Cl = 35.5]

QUESTION -18

Write balanced chemical equation and name the reaction

(i) Ethanal treated with dilute sodium hydroxide

(ii) Benzaldehyde treated with concentrated sodium hydroxide

(iii) Ethanoyl chloride treated with hydrogen in presence of Pd/ $BaSO_4$, S in boiling xylene

(iv) Acetone treated with zinc amalgam and concentrated HCl

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