VISHWA BHARTI PUBLIC SCHOOL
HALF YEARLY EXAMINATION (2017-18)

Class: XII   **Time:** 03 hrs

Subject: Chemistry   **Date:** 25-09-17   **M.M:** 70

General Instructions:

(I)   All questions are compulsory.

(II)   Question number 1 to 5 are very short answer questions and carry 1 mark each.

(III)   Question number 6 to 10 are short answer question and carry 2 marks each.

(IV)   Question number 11 to 22 are short answer questions and carry 3 marks each.

(V)   Question number 23 is value based question and carry 4 marks.

(VI)   Question number 24 to 26 are long answer questions and carry 5 marks each.

(VII)   Use log tables if necessary. Use of calculator not allowed.

(VIII)   Question paper consists of 26 questions and 4 pages.

Q1	Zinc oxide is white but it turns yellow on heating. Explain.	1
Q2	What is difference between phosphorus doped and Gallium doped semiconductors?	1
Q3	Can a reaction have zero activation energy ? why or why not ?	1
Q4	On electrolysis of an aqueous solution of NaCl, why H_2 and not Na is liberated at the cathode ?	1
Q5	Ether are cleaved only by acids not by bases. Explain.	1
Q6	Analysis shows that nickel oxide has the formula $Ni_{0.98}O_{1.00}$. What fraction of nickel exists as Ni^{2+} and Ni^{3+} ions?	2
Q7	Determine the osmotic pressure of a solution prepared by dissolving 25mg of k_2SO_4 in 2 litres of water at 25^0 C ,assuming that it is completely dissociated.	2
Q8	Write the major product of the reactions :	2

(I) $CH_2=CH-Br \xrightarrow{KCN}$

(II)   ⬡   + $(CH_3)_3C-CH_2-Br \longrightarrow$
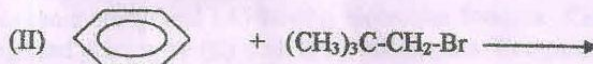
Q9 How will you convert : 2
    (a) Nitrobenzene to Benzoic acid
    (b) Benzoic acid to Aniline

Q10 A reaction is second order with respect to a reactant. How is the rate of 2 reaction affected if the concentration of reactant is
    (a) Doubled   (b) Reduced to ½.

Q11 An element has BCC arrangement with cell edge of 288pm. The 3 density of element is $7.2 g/cm^3$. How many atoms are present in 208 g of element?

Q12 Conductivity of 0.00241M acetic acid is $7.896 \times 10^{-5}\ S\ cm^{-1}$. Calculate 3 its molar conductivity. If $\wedge°m$ for acetic acid is 390.5 $Scm^2 mol^{-1}$, what is its dissociation constant?

Q13 For a First Order reaction ,show that the time required for 99% 3 completion of a first order reaction is twice the time required for the completion of 90%.

Q14 What happens when 3
    (a) Ethyl chloride is treated with aqueous KOH?
    (b) Methyl Chloride is treated with KCN ?
    (c) Methyl Bromide is treated with sodium in the presence of dry ether?

Q15 (a) Explain how rusting of iron is envisaged as setting up of 3 electrochemical cell.

(b) Write the chemistry of recharging of lead storage battery, highlighting all the material that are involved during recharging.

Q16 The rate of reaction quadruples when the temperature changes from 3 293k to 313k. Calculate the energy of activation of the reaction assuming that it does not change with temperature.

Q17 Give reasons 3
    (a) Boiling point of ethanol is higher than that of dimethyl ether.
    (b) Anisole on reaction with HI gives phenol and CH_3I as main products and not iodobenzene and CH_3OH .
    (c) Dipole moment of phenol is smaller than that of methanol.

Q18 What is meant by positive and negative deviation from Raoults law. 3 Explain?

Q19 Predict the alkene that would be formed by dehydrohalogenation of the 3 following halides with sodium ethoxide in ethanol and identify the major alkene.
    (a) 1-Bromo-1-methylcyclohexane

2

(b)   2-chloro-2-methylbutane

(c)   3-Bromo-2,2,3-trimethylpentane

Q20 Give chemical tests to distinguish between the following pairs of   3
compounds:

     (a)   Propanal and Propanaone

     (b)   Phenol and Benzoic acid

     (c)   Acetophenone and Benzophenone

Q21 Write the equation of the reaction of hydrogen iodide with   3

     (a)   Benzyl ethyl ether

     (b)   Methoxybenzene

     (c)   2-methyl-2-methoxypropane

Q22 A solution of $Ni(NO_3)_2$ is electrolysed between platinum electrodes   3
using a current of 5.0 ampere 20 minutes .What mass of nickel will be
deposited at the cathode?

Q23 Swati 's father wanted to go to hospital to see his ailing friend.Swati   4
insisted to accompany his father.On reaching hospital, Swati noticed a
peculiar smell.

After reading above passage answer following questions :-

     (a)   Name the chemical which causes the hospital smell.

     (b)   What is the use of chemical and how does it work?

     (c)   How is this chemical prepared in laboratory?

     (d)   Can we use some other chemical which has desired effect
but no smell?

Q24 (a) Write short notes on   5

     (I)   Coupling reaction

     (II)   Hofmann's bromamide reaction

     (III)   Gabriel Phthalimide reaction

  (b) Convert:

     (I) 3-methylaniline to 3-nitrotoluene

     (II) Aniline into 1,3,5-tribromobenzene

OR

     (a)   Give chemical test to distinguish between   5

     (I)   Aniline and Methylamine

     (II)   Aniline and Benzylamine

     (III)   Secondary and tertiary amines

     (b)   Convert:

     (I)   Nitrobenzene to Benzoic acid

     (II)   Benzyl chloride to 2-Phenylethanamine

Q25 An organic compound (A) having molecular formula $C_9H_{10}O$ forms   5
orange red precipitate (B) with 2,4-DNP reagent. Compound (A) gives
yellow precipitate (C) when heated in presence of iodine and NaOH

along with colourless compound (D). (A) does not reduce Tollen's reagent or fehling's solution nor does it decolourises bromine water. On drastic oxidation of (A) with chromic acid ,a carboxylic acid (E) of molecular formula $C_7H_6O_2$ is formed. Deduce the structure of organic compounds (A) to (E) and write the reaction involved.

OR

(a) How will you convert the following: 5
   (I)   Propanone to propan-2-ol
   (II)   Ethanal to 2-hydroxy propanoic acid
   (III)   Toluene to benzoic acid
(b) Explain:-
   (I)   Rosenmund reduction
   (II)   Etard reaction

Q26 (a) (I) Name a colligative property which is used to calculate   5
molecular mass of macromolecules.
(II) Explain the basic principle behind reverse osmosis.

(b) 2g of benzoic acid (C_6H_5COOH) dissolved in 25 g of benzene shows a depression in freezing point equal to 1.62K .Molal depression constant for benzene is 4.9K kg mol^{-1}.what is the percentage association of acid if it forms dimer in solution.

OR

(a) What type of deviation is shown by a mixture of ethanol and   5
acetone ? Give reason .

(b) Calculate (I) Molality (II) Molarity (III) Mole fraction of KI if the density of 20% (mass/ mass) aqueous KI is 1.202 g ml $^{-1}$.

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