SHRI S.H.KELKAR COLLEGE OF ARTS, COMMERCE AND SCIENCE, DEVGAD.
(SINDHUDURG)
S.Y.B.Sc. SEMESTER III EXAMINATION OCTOBER 2023
COURSE: General ChemistryII **COURSE CODE – USCH302**
TIME : ९:३० ए.म. to ११:०० ए.म. **MAX. MARKS: 75**
SET 2 **DURATION: 2.5 Hrs**

Exam Department

N.B. 1.All the questions are compulsory
2. Figures to the right indicates full marks
3. The use of log table/Programmable calculators are allowed.
4. Answers for the same question should be written together.

Q. 1)Select the correct option and complete the following statement. **(15)**

1) The difference in the enthalpy of transition state and enthalpy of reactant is.....
a) Free energy b) Activation energy c) entropy

2) Nitration of phenol is an example of .....reaction.
a) consecutive reaction b) parallel reaction. c) opposing reaction

3).In an ideal solution , partial pressure of component is equal to its mole fraction multiplied by its ..... in pure state.
a) Velocity. b) Vapour pressure. c) Time.

4) Sum of mole fraction of all the constituent of solutions is/are.....
a) 1 b) 0 c) 2

5) 4. The correct form of Arrhenius equation is .....
a) $k = A \cdot e^{Ea/RT}$. b) $k = A \cdot e^{-Ea/RT}$. c)$\log k = A \cdot e^{-Ea/RT}$

6)In SiO_2 ,silicon undergoes ..... hybridisation.
a) sp. b) sp^2. c) sp^3

7) Borax is synthesized from ____
a) Tincal b) Bauxite c) Mica

8) The type of hybridization of Boron in diborate is _____
a) Sp^3 b) Sp^2 c) Sp^3d

9) Which of the following halogen compound of nitrogen is not observed?
a) NF_3. b) NF_5. c) NCl_3

10) Which of the following is the source of Boron?
a) Bauxite b) Mica c) Kernite

11)Benzoin is .....
a)α-hydroxy ketone b) β-hydroxy ketone c) γ-hydroxy ketone

12)Aldehydes and ketones reacts with primary amine to give .....
a) Enamine b) Iminium salt c) Imine

13)Friedel crafts acylation reaction is used to prepare .....
a)Acetone b) Acetaldehyde c) Acetophenone

14)Formaldehyde reacts with Methyl Magnesium Iodide followed by acidic hydrolysis gives .....

a)methyl alcohol b) ethyl alcohol c) isopropyl alcohol

15)Primary alcohol is obtained by reaction of Grignard reagent with .....

a)Acetaldehyde b) Formaldehyde c) Benzaldehyde

Q. 2) Attempt any THREE of the following. **(15)**

A) Sate the important assumptions of collision theory of reaction rate. What are the drawbacks of theory? (5)

B) Explain Lindmann theory of Unimolecular gas phase reaction. (5)

C) i)How is energy energy of activation of reaction experimentally determined? (3)

ii) If the rate of reaction doubles from 22 ° C to 32° C, Calculate the energy of activation of the reaction . [R = 8.314 $JK^{-1}mol^{-1}$] (2)

D) Compare the collision theory with the activated complex theory highlighting the relative merits of each theory. (5)

E) What ate partially miscible liquids? Explain the terms upper critical solution temperature and lower critical solution temperature. (5)

Q. 3) Attempt any THREE of the following. **(15)**

A) Discuss in detail the bridge structure of diborane. Bring out clearly the nature of bonds in hydrogen bridges. (5)

B) Write atomic number, electronic configuration of Silicon and mention its position in the periodic table. Name any two compounds of Silicon. (5)

C) (i) Discuss the gradation in properties of elements in group 13 with respect to. (5)

a)Metallic character b)Electronegativity c)Oxidation state. (3)

(ii) Explain why Borane are electron deficient in nature. (2)

D)Give preparation of hydrazine and state its properties. (5)

E) With suitable diagram, explain the synthesis of ammonia by the Bosch-Haber process. (5)

Q. 4) Attempt any THREE of the following. **(15)**

A)What is the action of following on acetone , (Give chemical reaction) (3)

a)(i) CH_3CH_2OH / H^+ (ii) CH_3MgI (iii) $NH_2NHC_6H_5$

b)What is the action of following on acetaldehyde , (Give chemical reaction) (2)

(i) $NaHSO_3$ (ii) HCN

B)Write a note on : iii) Gattermann Koch reactioniv) iv) Oxidation of alcohols (5)

C)Explain the mechanism of Benzoin condensation . (5)

D)Give any two examples of aldehyde & ketone.Give a general mechanism for addition of nucleophile to carbonyl carbon. (5)

E)Explain acid & base catalysed mechanism of Enolization. (5)

Q. 5) Attempt any THREE of the following. **(15)**

A)An immiscible liquid A was found to distil freely in stream at temperature of 95 ^{0} C when the atmosphere pressure was 9.917× 10 4 Nm^{-2}. The value pressure of pure water at this temperature is 8.451 × 10 4 Nm^{-2}. The distillate contained 55 percent by weight of immiscible liquid A. Calculate the molecular weight of liquid A. (5)

B) State and explain Nernst Distribution Law . What are its important applications? (5)

C) What is Borax? Explain any two methods used for its synthesis. (5)

D)Explain the chemical properties of group 15 elements. (5)

E) Give the Preparation of the following ,

i) 2-Butanone ii)Succinic acid (5)

F) Explain the mechanism of Cannizaro's reaction. (5)