

Anjuman Islam Janjira Degree College of Science

Murud-Janjira, Raigad-
402401 Affiliated to
University of Mumbai

Class: -S.Y.B.Sc.(G.S)	Subject: - Chemistry- II
Semester:- III	Course code: -USCH302
Exam Event:- Winter 2023 (SH)	Marks: - 75
Date: - 19/10/2023	Duration: - 2:30 Hours

N.B:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Use of log-table/non programmable calculator is allowed.
4. Answer for the same question as far as possible should be written together.

Q.1 Attempt any four of the following.

20

- A. Explain Chain reaction with Example.
- B. Explain terms with suitable example
 - a) Consecutive reaction
 - b) Parallel reaction.
- C. 40g of Liquid A and 70gm of liquid B are mixed together to form an ideal solution. Calculate the composition of the vapour.
- D. State and explain Rault's Law. Explain the terms a) Upper critical solution temperature b) Lower critical solution temperature
- E. State Nernst Distribution Law. Explain what happen if a state undergoes association and dissociation one or both solvent.
- F. A sample polymer contains 10, 20, 30 and 40 percent molecules of the polymer with molar mass 10,000, 12,000, 14,000 and 16,000 respectively. What is the mole fraction of each type of polymer molecule and what are the number and weight average molar masses of the polymer sample?

Q.2 Attempt any four of the following.

20

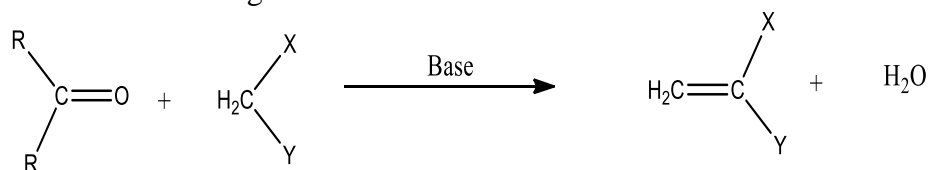
- A. Draw the structure of BF_3 . Why Does it called lewis acid? Write it's any three applications.
- B. What is Borax? Write it's one method of synthesis. Write its two uses.
- C. Discuss the structure of SiO_2 & SiO_4
- D. Explain zone refining technique for purification of silicon.
- E. Name and formulate any five oxides of nitrogen. Find Oxidation state of nitrogen in each of them.
- F. Explain the Synthesis of ammonia by Bosch-Haber synthesis.

Q.3 Attempt any four of the following.

20

- A. Name the following reaction. Give its mechanism

05



- B. i) Write a note on Gattermann Koch formylation. 03
 ii) Discuss the reduction of crotonaldehyde with LiAlH_4 02
- C. i) Give the mechanism of base catalyzed enolization 03
 ii) How is tertiary alcohol obtained from Grignard reaction 02
- D. i) Explain general mechanism for nucleophilic addition to carbonyl compound. 03
 ii) Give the preparation of cyclic ketal from propanone 02
- E. Give the preparation of the following 05
 i) propanoic acid from ethyl acetoacetate
 ii) 2-pentanone from acetyl acetone
- F. i) Write note on Rosenmund reduction 03
 ii) What are stabilized enols? 02

Q.1 Select correct and complete the following sentence. (Any Eight) 08

- 1) Nitration of aniline is an example of _____ reaction.
 a) Consecutive b) Parallel c) Opposing
- 2) Which of the following is fluorocarbon plastic?
 a) Teflon b) Nylon c) PVC
- 3) The ratio of weight average molecular weight to number average molecular weight is called _
 a) Polydispersity index b) Degree of polymerization c) Z-average molecular weight
- 4) _____ is the mixture of an ideal solution.
 a) C_6H_6 and $\text{C}_6\text{H}_5\text{CH}_3$ b) HNO_3 and H_2O c) CHCl_3 and CH_3COCH_3
- 5) _____ is the atomic Number of Silicon
 a) 13 b) 14 c) 16
- 6) The reluctance of the ns electrons to take part in bonding is called _____.
 a) Donating effect b) Inert Pair effect c) Resonating effect
- 7) _____ is incorrect statement as far as structure of diborane is concerned.
 a) There are two bridging hydrogen atoms in diborane.
 b) All B-H bonds in diborane are similar.
 c) The hydrogen atoms are not in the same plane in diborane.
- 8) Non - Combustible hydride is_____
 a) NH_3 b) PH_3 c) AsH_3
- 9) _____ is not hydrolyzed.
 a) AsCl_3 b) PF_3 c) NF_3
- 10) PCC means _____
 a) Pyridine chlorochromate b) Pyrrole chlorochromate c) Pyridinium chlorochromate

11) Diethyl malonate is _____

- a) $\text{H}_5\text{C}_2\text{OOC}-\text{CH}_2-\text{CH}_2-\text{COOC}_2\text{H}_5$
- b) $\text{H}_5\text{C}_2\text{OOC}-\text{CH}_2-\text{CH}-\text{CH}_2-\text{COOC}_2\text{H}_5$
- c) $\text{H}_5\text{C}_2\text{OOC}-\text{CH}_2-\text{COOC}_2\text{H}_5$

12) The correct order of reactivity is.

- a) $\text{H}-\text{CO}-\text{H} > \text{R}-\text{CHO} > \text{R}_2\text{CO}$
- b) $\text{R}-\text{CHO} > \text{H}-\text{CO}-\text{H} > \text{R}_2\text{CO}$
- c) $\text{H}-\text{CO}-\text{H} < \text{R}-\text{CHO} < \text{R}_2\text{CO}$

(B) State whether the following statement are true and false. (Any three)

03

- i) Chlorination Toluene is an example of reversible reaction
- ii) A homogenous mixture consists of a single phase
- iii) There are two bridging hydrogen atoms in diborane.
- iv) Removal of water molecule is condensation reaction.
- v) Hybridization of 'C' and 'O' in carbonyl group is $\text{sp}-\text{sp}^2$

C) Math the following (any four)

04

i) Raoult's law

i) $\text{H}_5\text{C}_2\text{OOC}-\text{CH}_2-\text{CH}_2-\text{COOC}_2\text{H}_5$

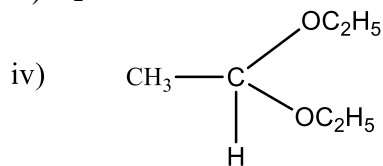
ii) NH_3

ii) $\frac{k(T+10)}{K_T}$

iii) Nitric oxide

iii) $X_2 = P^0 - P / P^0$

iv) Temperature coefficient



v) Acetal

v) Odd electron molecule

vi) Diethyl Malonate

vi) $\text{H}_5\text{C}_2\text{OOC}-\text{CH}_2-\text{COOC}_2\text{H}_5$

vii) Square planar.

viii) $K = C_1/C$