

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 – I
Semester:- III	Course code: -USCH301
Exam Event:- Winter 2023 (SH)	Marks: -75
Date: - 18/10/2023	Duration: - 02:30 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. Derive Gibb's – Helmholtz equation.
- B. Explain the terms i) Helmholtz free energy ii) Gibb's free energy
- C. Differentiate between electronic conductance and electrolytic conductance.
- D. Explain the factors affecting transport number.
- E. Conductance of a 0.1N solution of an electrolyte was found to be $4.76 \times 10^{-3} \text{ S}$ at 25°C . Calculate the equivalence conductance of the solution of 25°C , if the electrodes in the cell are 0.8 cm apart and have an area of 0.7628 cm^2 .
- F. Define terms – i) conductance ii) specific conductance iii) cell constant
iv) molar conductance v) transport number

Q.2 Attempt any four of the following.

20

- A. What is Ionic Bond? Explain conditions for the formation of ionic bond.
- B. Explain the following :- i) Radius ratio and limiting radius ratio
ii) Types of ionic crystals depending on stoichiometry
- C. Draw and explain Molecular Orbital Diagram for O_2 molecule.
- D. Give the difference between sigma molecular orbitals and pi molecular orbitals.
- E. What is formal charge? Give the formula to calculate formal charge. Calculate formal charge on 'P' and 'H' in PH_4^+ .
- F. Explain formation of sp hybrid orbitals and sp hybridization.

Q.3 Attempt any four of the following.

20

- A. Explain SN^2 reaction with suitable example.
- B. Explain Benzyne intermediate mechanism with suitable example.
- C. Give and explain different types of organometallics.
- D. Give any two methods of preparation of alcohol with suitable examples.
- E. Explain the Williamson synthesis with example & Give the reaction of epoxide with Grignard reagent.
- F. Complete the following reactions



