

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2023

M.Sc.-I Semester (BT)

COURSE CODE (CREDITS):20MS1PH111

MAX. MARKS: 35

COURSE NAME: Basics of Chemistry and Physics

COURSE INSTRUCTORS: Dr. Poonam /Prof. Sunil Kumar Khah

MAX. TIME: 2 Hours

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

- Q1(a). Explain why thermoplastics can be heated and reshaped again while thermosetting plastics cannot? 3
- (b). Discuss the various characteristics and applications of polymers. 3
- Q2(a). Describe concentration cell with the help of diagram. 3
- (b). Explain the adsorption isobar of physisorption and chemisorption. 3
- Q3(a). Following reactions occur at cathode during the electrolysis of aqueous silver chloride solution:
- | | | | | | | |
|--------------------------|---|-------|-------------------|---------------------------|-------------------|---|
| $\text{Ag}^+(\text{aq})$ | + | e^- | \longrightarrow | $\text{Ag}(\text{s})$ | $E^\circ = +0.80$ | V |
| $\text{H}^+(\text{aq})$ | + | e^- | \longrightarrow | $1/2\text{H}_2(\text{g})$ | $E^\circ = 0.00$ | V |
- On the basis of their standard reduction electrode potential (E°) values, which reaction is feasible at the cathode and why? 3
- (b). A polymer has the following molar mass.
- | Number of molecules | Molar mass (g/mol) |
|---------------------|--------------------|
| 50 | 5000 |
| 75 | 6000 |
- Calculate the number average, weight average and PDI. 4
- Q4(a). Elucidate the principle of bioenergetics. 3
- (b). Discuss the Gibbs free energy and its applications in biological processes. 3
- Q5(a). Write Maxwell thermodynamic relations. 3
- (b). How is Bragg's law related to Diffraction? 3
- (c). Differentiate between interface, Diffraction and polarization. 4