

GUJARAT TECHNOLOGICAL UNIVERSITY

DI -1 SEMESTER – OLD PAPER – W24 TO S25 – QUESTION BANK(English)

Subject Name & Code:

Engineering Chemistry- DI01000071

Unit 1: Atomic Structure, Chemical Bonding and Solutions

Repeated Questions:

1. Describe Pauli's exclusion principle with example.
 - Appeared in: S25 (Q.2(A)(1), 03 Marks)
2. Explain Ionic bond with proper example.
 - Appeared in: S25 (Q.2(A)(2), 03 Marks)
3. Explain Hydrogen bond and its types with examples.
 - Appeared in: W24 (Q.5(B)(1), 04 Marks) & S25 (Q.2(B)(1), 04 Marks)
4. Compare between orbits and orbitals (four points each).
 - Appeared in: W24 (Q.2(B)(1), 04 Marks)
5. Explain solute, solvent and solution with the help of example.
 - Appeared in: W24 (Q.3(A)(1), 03 Marks)

Other Important Questions:

6. Calculate pH of 0.01M HCl aqueous solution.
 - Appeared in: S25 (Q.2(A)(3), 03 Marks)
7. Calculate molarity of solution prepared by dissolving 5.6 g of KOH in water to make 1000 ml of solution. (M.W. of KOH = 56 g/mole)
 - Appeared in: S25 (Q.2(B)(2), 04 Marks)
8. Describe factors affecting the degree of ionization.
 - Appeared in: S25 (Q.2(B)(3), 04 Marks)
9. List the three importance of pH in various fields.
 - Appeared in: W24 (Q.2(A)(1), 03 Marks)
10. Define: Buffer solutions, Half-cell, Faraday's first law of electrolysis.
 - Appeared in: W24 (Q.2(A)(3), 03 Marks)
11. Explain the formation of Electrovalent bond in NaCl.

- **Appeared in:** W24 (Q.3(A)(3), 03 Marks)

12. Solve: Calculate the pH and pOH of 0.004 M HCl aqueous solution. ($\log 4 = 0.6021$)

- **Appeared in:** W24 (Q.5(A)(1), 03 Marks)

Unit 2: Electrochemistry

Repeated Questions:

1. **Explain the construction and working of electrochemical cell.**
 - **Appeared in:** S25 (Q.3(B)(1), 04 Marks)
2. **Write a brief note on Electroplating.**
 - **Appeared in:** S25 (Q.3(A)(1), 03 Marks)
3. **Explain electrefining of impure Cu with chemical equations and a labeled diagram.**
 - **Appeared in:** W24 (Q.3(B)(1), 04 Marks)

Other Important Questions:

4. **State the factors affecting the rate of corrosion.**
 - **Appeared in:** W24 (Q.2(A)(5), 03 Marks)
5. **Define: Buffer solutions, Half-cell, Faraday's first law of electrolysis.**
 - **Appeared in:** W24 (Q.2(A)(3), 03 Marks)
6. **Explain Pitting corrosion.**
 - **Appeared in:** S25 (Q.3(A)(2), 03 Marks)
7. **Differentiate between Galvanizing and Tinning.**
 - **Appeared in:** S25 (Q.3(A)(3), 03 Marks)
8. **Explain any four factors affecting the rate of corrosion.**
 - **Appeared in:** S25 (Q.3(B)(2), 04 Marks)
9. **Explain Faraday's Laws of Electrolysis.**
 - **Appeared in:** Syllabus (Implied from W24 Q.2(A)(3))

Unit 3: Corrosion of metals and its prevention

Repeated Questions:

1. **Explain Pitting corrosion.**
 - **Appeared in:** S25 (Q.3(A)(2), 03 Marks)
2. **Explain any four factors affecting the rate of corrosion.**
 - **Appeared in:** S25 (Q.3(B)(2), 04 Marks)
3. **Explain metal cladding for the prevention of corrosion of metals.**
 - **Appeared in:** W24 (Q.4(A)(1), 03 Marks)
4. **Explain waterline corrosion with chemical equations and labeled diagram.**
 - **Appeared in:** W24 (Q.4(A)(2), 03 Marks)

Other Important Questions:

5. **State the factors affecting the rate of corrosion.**
 - **Appeared in:** W24 (Q.2(A)(5), 03 Marks)
6. **Differentiate between Galvanizing and Tinning.**
 - **Appeared in:** S25 (Q.3(A)(3), 03 Marks)

Unit 4: Fuels and Combustion

Repeated Questions:

1. **What is a fuel? State characteristics of an ideal fuel.**
 - **Appeared in:** S25 (Q.4(A)(1), 03 Marks)
2. **Enlist properties and applications of LPG and CNG.**
 - **Appeared in:** S25 (Q.3(B)(3), 04 Marks)
3. **Write a brief note on power alcohol.**
 - **Appeared in:** S25 (Q.4(B)(1), 04 Marks)
4. **Classify fuels on the basis of its sources and physical states with one example of each.**
 - **Appeared in:** W24 (Q.2(B)(3), 04 Marks)
5. **Explain Octane number for gasoline.**
 - **Appeared in:** W24 (Q.3(A)(5), 03 Marks)
6. **Explain bio-diesel with four important points.**
 - **Appeared in:** W24 (Q.2(B)(5), 04 Marks)

Other Important Questions:

7. **Theoretical calculation of HCV and LCV of fuel using Dulong's formula.**
 - **Appeared in:** Syllabus (Implied from W24 Q.1(6))

Unit 5: Lubricants

Repeated Questions:

1. **What is lubricant? State functions of lubricant.**
 - **Appeared in:** S25 (Q.4(B)(2), 04 Marks)
2. **What should be the qualities of the lubricants have which are to be used in cutting tools & gears?**
 - **Appeared in:** S25 (Q.4(B)(3), 04 Marks)
3. **Demonstrate the function of boundary lubrication with diagram.**
 - **Appeared in:** W24 (Q.4(B)(1), 04 Marks)
4. **Explain how viscosity is measured through redwood viscometer with labelled diagram.**
 - **Appeared in:** W24 (Q.4(B)(2), 04 Marks)

Other Important Questions:

5. **Grease is a _____ type of lubricant. [Semi solid]**
 - **Appeared in:** S25 (Q.1(10), 01 Mark)
6. **_____ is used to measure viscosity of lubricating oil. [Viscometer]**
 - **Appeared in:** S25 (Q.1(9), 01 Mark)
7. **The flash point of a lubricant should be _____. [High]**
 - **Appeared in:** W24 (Q.1(9), 01 Mark)
8. **The unit of viscosity is _____. [Poise]**
 - **Appeared in:** W24 (Q.1(8), 01 Mark)

Unit 6: Polymers, Elastomers, Insulating Materials and Semiconductors

Repeated Questions:

1. **Illustrate classification of polymer based on molecular structure.**
 - Appeared in: S25 (Q.4(A)(2), 03 Marks)
2. **Write a short note on Biodegradable Polymer.**
 - Appeared in: S25 (Q.4(A)(3), 03 Marks)
3. **Distinguish between Thermoplastic and Thermosetting plastic.**
 - Appeared in: S25 (Q.5(B)(2), 04 Marks) & W24 (Q.5(A)(3), 03 Marks)
4. **Write a short on Vulcanization of rubber.**
 - Appeared in: S25 (Q.5(B)(1), 04 Marks)
5. **Explain n-type semiconductors and p-type semiconductors.**
 - Appeared in: S25 (Q.5(A)(1), 03 Marks)
6. **Describe extrinsic semiconductors and its types with examples.**
 - Appeared in: W24 (Q.5(A)(2), 03 Marks)

Other Important Questions:

7. **Define: Semiconductor, Insulating material, Elastomer, Addition polymerization.**
 - Appeared in: W24 (Q.4(B)(3), 04 Marks)
8. **Explain preparation of ethene with chemical equation. Also write its two properties and two uses.**
 - Appeared in: W24 (Q.3(B)(2), 04 Marks)
9. **Explain preparation of Buna-S rubber with chemical equation. Also write its two properties and two uses.**
 - Appeared in: W24 (Q.3(B)(3), 04 Marks)
10. **Monomer of PVC is _____. [vinyl chloride]**
 - Appeared in: S25 (Q.1(11), 01 Mark)
11. **_____ is an example of condensation polymer. [Bakelite]**
 - Appeared in: S25 (Q.1(12), 01 Mark)
12. **Insulating material should have property of _____. [all of these]**
 - Appeared in: S25 (Q.1(13), 01 Mark)
13. **Phenol formaldehyde polymer is also known as [Bakelite]**
 - Appeared in: W24 (Q.1(11), 01 Mark)

Unit 7: Electrochemical Energy Sources

Repeated Questions:

1. **Differentiate between primary cell and secondary cell.**
 - Appeared in: S25 (Q.5(A)(2), 03 Marks) & W24 (Q.5(B)(2), 04 Marks)
2. **What is Solar cell? Write advantages and disadvantages of Solar cell.**
 - Appeared in: S25 (Q.5(A)(3), 03 Marks)
3. **Explain construction and working of lead acid storage cell with diagram.**
 - Appeared in: S25 (Q.5(B)(3), 04 Marks) & W24 (Q.5(B)(3), 04 Marks)
4. **Explain the working principle of solar cells.**
 - Appeared in: W24 (Q.4(A)(3), 03 Marks)

Other Important Questions:

5. **Potential of a dry cell is _____ V. [1.5]**
 - Appeared in: S25 (Q.1(14), 01 Mark)
6. **Construction and Working of Dry cell.**
 - Appeared in: Syllabus
7. **Construction and Working of Nickel-Cadmium battery/cell.**
 - Appeared in: Syllabus
8. **Fuel cells: Definition and Characteristics, Construction and Working of Hydrogen-Oxygen fuel cell.**
 - Appeared in: Syllabus
