Jharkhand University of Technology, Ranchi

Diploma 1st Semester Examination, 2024 (NEP-2024)

Subject : Engineering Chemistry **Subject Code : BSC103**

Time Allowed : 3 Hours **Full Marks : 70**

Pass Marks : 21

Answer in your own words.
Answer five *questions in which* Question No. 1 *is compulsory.*
The figures in the margin indicate full marks.
All questions carry equal marks.

1. Choose the correct option: 2×7=14

(i) The electronic configuration of Cu^{2+} ion is

(a) [Ar] $4s^1\ 3d^8$ (b) [Ar] $4s^2\ 3d^{10}\ 4p^1$

(c) [Ar] $4s^1\ 3d^{10}$ (d) [Ar] $3d^9$

(ii) Bohr proposed that while revolving in discrete orbits, the electrons

(a) gain energy (b) lose energy

(c) do not radiate energy (d) first lose energy and then gain energy

(iii) What is the most difficult atom to ionize?

(a) Hydrogen (b) Helium

(c) Beryllium (d) Neon

(iv) Which of the following is a synthetic polymer commonly used in making plastic?

(a) Cellulose (b) Starch

(c) Protein (d) Polyethylene

(v) Which of the following is not a type of electrochemical cell?

(a) Voltaic cell (b) Photovoltaic cell

(c) Electrolytic cell (d) Fuel Cell

(vi) Which industry causes all three: air, water and land pollution?

(a) Fertilizer and pesticides (b) Oil refineries and iron, steel

(c) Oil refineries and caustic soda (d) Iron, steel and caustic soda

(vii) Which of the following metal is utilized in trucks, automobile engines, aircraft and missiles?

(a) Stainless steel (b) Carbon steels

(c) Magnesium (d) Cast irons

2. (a) Write about the different types of valency with suitable examples.

(b) Define orbitals. Explain Aufbau Principle for filling up of the orbitals. 7+7

3. (a) Explain Arrhenius Theory of Ionization.

(b) What is degree of Ionization? Discuss the factors affecting degree of ionization. 7+7

4. (a) What are different types of alloys? Describe the purpose of making alloys.

(b) Explain the physical properties & applications of Cu and Al. 7+7

5. (a) Define polymers. Compare natural and synthetic rubber with suitable examples.

(b) Write about the engineering applications of plastic based on their properties. 7+7

6. (a) What do you mean by E-waste? Write about different types of waste.

(b) Describe air pollution and explain causes and remedial measure of air pollution. 7+7

7. Write short notes on *any four* of the following: 3.5×4=14

(a) Water Pollution

(b) Electrolysis

(c) Gun Metal

(d) Thermal Insulators

(e) BOD and COD
