

**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

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*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.*

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1. Choose the correct option:

2×7=14

- (i) The electronic configuration of  $\text{Cu}^{2+}$  ion is  
☒ (a)  $[\text{Ar}] 4s^1 3d^8$  (b)  $[\text{Ar}] 4s^2 3d^{10} 4p^1$   
(c)  $[\text{Ar}] 4s^1 3d^{10}$  (d)  $[\text{Ar}] 3d^9$
- (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. 7+7  
(b) Define orbitals. Explain Aufbau Principle for filling up of the orbitals.
3. (a) Explain Arrhenius Theory of Ionization. 7+7  
(b) What is degree of Ionization? Discuss the factors affecting degree of ionization.
4. (a) What are different types of alloys? Describe the purpose of making alloys. 7+7  
(b) Explain the physical properties & applications of Cu and Al.
5. (a) Define polymers. Compare natural and synthetic rubber with suitable examples. 7+7  
(b) Write about the engineering applications of plastic based on their properties.
6. (a) What do you mean by E-waste? Write about different types of waste. 7+7  
(b) Describe air pollution and explain causes and remedial measure of air pollution.
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