

**April 2025**  
**B.A./B.Sc.**  
**Sixth Semester**  
**DISCIPLINE SPECIFIC ELECTIVE – 4**  
**CHEMISTRY**  
*Course Code: CHD 6.21*  
(Inorganic Materials of Industrial Importance)

Total Mark: 70

Pass Mark: 28

Time: 3 hours

Answer five questions, taking one from each unit.

**UNIT-I**

1. (a) What are silicates? Give their structure. How are they classified? 1+1+3=5
- (b) Which raw materials are used for the manufacture of glass? 5
- (c) Write a note each on the following: 2×2=4
  - (i) Soda-lime glass
  - (ii) Lead glass
2. (a) Explain the different types of glass. 5
- (b) Explain the setting and hardening of cement. 5
- (c) Give the composition, properties, and uses of photosensitive glass. 4

**UNIT-II**

3. (a) Write the synthesis of urea as a fertilizer. Give their advantages and disadvantages. 6
- (b) With the help of a neat diagram, illustrate the working principle of fuel cell. 4
- (c) What are polyphosphates? Give its agricultural use. 2+2=4
4. (a) What are K-type fertilizer? Give the preparation and properties of  $K_2SO_4$  fertilizer. 1+3=4
- (b) Explain the characteristics of battery. 7
- (c) Write a note on lithium polymer batteries. 3

### UNIT-III

5. (a) What are enamels? Briefly explain the ingredients used in preparation of enamels. 7  
(b) Explain electroless-plating in detail. 5  
(c) Mention the chemical composition, properties, and uses of titanium dioxide. 2
6. (a) What is anodizing? Give its advantages and uses. 4  
(b) What is a paint? Explain the heat retardant and plastic paints. 1+4=5  
(c) What is surface coating? Explain plating and vapor deposition process. 1+4=5

### UNIT-IV

7. (a) Explain in detail the heat treatment method for metal surface. 5  
(b) Write the various reactions involved for removal of impurities in the manufacture of steel. 5  
(c) Give the composition, properties, and uses of the following:  
(i) Brass 2×2=4  
(ii) Nichrome
8. (a) Write an account on ferrous and non-ferrous alloys. 5  
(b) Briefly explain specific properties of elements in alloy. 3  
(c) Discuss the properties and composition of different types of steel. 6

### UNIT-V

9. (a) Explain phase transfer catalyst in chemistry and give its uses. 5  
(b) Give the preparation and uses of the following compounds:  
(i) Lead azide 2×3=6  
(ii) PETN  
(iii) RDX  
(c) Give the main characteristics of catalyst. 3
10. (a) What is heterogeneous catalysis? Discuss the mechanism of heterogeneous catalysis. 1+5=6

- (b) Write a note each on the following: 2×2=4
- (i) Deactivation of catalysts
  - (ii) Phase transfer catalysts
- (c) What do you mean by rocket propellant? Give the requirements of a good propellant. 4
-