

**11700 : Applied Inorganic Chemistry : 1 SCT 1**

P. Pages : 2

Time : Three Hours

**AW - 2929**

Max. Marks : 80

- Notes :
1. Answer **three** question from section A and **three** question from section B.
  2. Diagrams and chemicals equations should be given wherever necessary.
  3. Discuss the reaction, mechanism wherever necessary.
  4. Use of pen Blue/Black ink/refill only for writing the answer book.

**SECTION - A**

1. a) Derive Schrodinger wave equation? 6  
b) State and explain de Broglie's Principle. 4  
c) Write the Postulates of Bohr's theory. 3

**OR**

2. a) What is ionisation potential? What are the factors affecting ionisation potential. 6  
b) State and explain Aufbau Principle. 4  
c) Explain electron affinity? How it differs from electronegativity. 3
3. a) Define lattice energy? How it is calculated by Born-Haber cycle. 5  
b) Differentiate covalent and ionic bond. 4  
c) Explain the following 4  
i) Inert pair effect ii) Metallic bond

**OR**

4. a) What is meant by hybridisation? Explain  $sp^3$  hybridisation with suitable examples. 4  
b) What is hydrogen bond? Classify with suitable example. 5  
c) Explain the following 4  
i) Coordinate bond ii) Odd electron bond
5. a) What is meant by hardness? Explain the ion exchange process. 6  
b) Calculate temporary and permanent hardness of water sample containing 4  
 $Mg(HCO_3)_2 = 7.3 \text{ mg/l}$   
 $Ca(HCO_3)_2 = 16.3 \text{ ppm}$   
 $MgCl_2 = 9.5 \text{ ppm}$   
 $CaSO_4 = 13.6 \text{ mg/l}$   
c) Write the disadvantages of hard water in industries. 4

**OR**

6. a) What is softening of water? Describe Zeolite process with advantages and limitation. 6  
 b) Write the effect of water on rock and minerals. 4  
 c) Differentiate scale and sludge formation. 4

**SECTION - B**

7. a) What is Ore? Describe froth flotation process. 5  
 b) What are compositions of bronze? Discuss their properties and applications. 4  
 c) Why alloys required? Write any four points. 4

**OR**

8. a) Discuss magnetic separation and Gravity separation method. 6  
 b) Explain with reaction  
     i) Calcination ii) Roasting 4  
 c) What is Brass? Give its properties and uses. 3
9. a) What are the factors affecting on corrosion. 5  
 b) Explain the following 4  
     i) Galvanic corrosion ii) Waterline corrosion  
 c) What is cathodic corrosion? Discuss impressed current cathodic protection. 4

**OR**

10. a) Explain the following 9  
     i) Pitting corrosion  
     ii) Intergranular corrosion  
     iii) Stress corrosion  
 b) What is wet corrosion? Discuss the mechanism. 4
11. a) Discuss the manufacturing process of Portland cement by wet method. 6  
 b) What is meant by refractory? Classify. 4  
 c) Give the composition and uses of 4  
     i) Soda glass ii) Borosilicate glass

**OR**

12. a) Discuss the manufacture process of glass. 6  
 b) Why cement called Portland cement? Explain the role of Gypsum in cement. 4  
 c) Write any two properties and uses of refractory. 4

\*\*\*\*\*