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Sl.No.

Total No. of Pages : 4

**VI Semester III B.Sc. Examination, September - 2021**  
**(Scheme : CBCS) (2018-19 Batch Onwards)**  
**CHEMISTRY (Paper - VI) (DSE)**

**Time : 3 Hours**

**Max. Marks : 80**

**Instruction :** Write equations and draw neat diagrams wherever necessary.

**PART - A**

Answer all the questions.

**[8 × 1 = 8]**

1. a) Name the important ore of tungsten.
- b) What are ferrous alloys?
- c) What is sonochemistry?
- d) Give IR stretching frequency value of – OH group.
- e) Write the importance of – tartaric acid.
- f) Write reduced phase rule.
- g) What is adsorption?
- h) What are electrochemical cells?

**PART - B**

**(Inorganic Chemistry)**

Answer any three questions.

**[3 × 8 = 24]**

2. a) Explain the extraction of nickel from bessemerized matte by Mond's process. **[4]**
- b) Give the composition and properties of nickel steel. **[2]**
- c) Give the toxicity of Mercury. **[2]**

**P.T.O.**

3. a) Discuss the manufacture of steel. [4]  
b) Mention the applications of powder metallurgy. [2]  
c) Discuss the enzymatic role of cobalt in vitamin - B<sub>12</sub>. [2]
4. a) Explain the enzymatic role of iron in haemoglobin and myoglobin. [3]  
b) How is gold extracted from its ore by cyanide process? [3]  
c) Give the preparation of ferromanganese. [2]
5. a) How is lithium extracted by electrolysis of fused lithium chloride? [4]  
b) Explain Ellingham diagrams for reduction of metal oxides using carbon as reducing agent, with a suitable example. [4]

**PART - C**

**(Organic Chemistry)**

Answer any three questions. [3 × 8 = 24]

6. a) Discuss the advantages of polymer supported reagents. [3]  
b) What are natural pigments? Write the structure of β-carotene. [3]  
c) Give the synthesis of lactic acid. [2]
7. a) Mention the advantages and the limitations of Microwave induced organic synthesis. [3]  
b) Discuss the effect of conjugation on UV absorption spectra of acetone and methyl vinyl ketone. [3]  
c) What are nucleic acids? Mention their importance. [2]

8. a) How do you convert benzene diazonium chloride into : [4]  
i) chlorobenzene  
ii) phenylhydrazine
- b) Why TMS is used as an internal reference in NMR spectroscopy? [2]
- c) Explain the effect of heat on  $\alpha$  and  $\beta$  hydroxy acids. [2]
9. a) How many  $^1\text{H}$  NMR signals do you expect for : [3]  
i) Aniline  
ii) Propane  
iii) Acetophenone.
- b) Explain the mechanism of phase transfer catalysis. [3]
- c) Discuss the structure of DNA. [2]

**PART - D**

**(Physical Chemistry)**

Answer any three questions.

[3 × 8 = 24]

10. a) Derive Nernst equation for single electrode potential. [3]  
b) Explain the principle and procedure involved in flash photolysis. [3]  
c) Mention the advantages of glass electrode. [2]
11. a) What are concentration cells? How are they classified? Give one example for each. [3]  
b) Explain the phase diagram of water system. [3]  
c) What are fast reactions? Give an example. [2]

12. a) Derive BET equation. [3]  
b) Explain temperature jump method for the study of fast reactions. [3]  
c) Write Gibb's phase rule. Mention the terms involved in it. [2]
13. a) Calculate emf of the galvanic cell  $Zn|Zn^{2+}(0.1M)||Ag^+(1M)|Ag$  and write the cell reaction ( $E_{Zn}^{\circ} = -0.76 V$  and  $E_{Ag}^{\circ} = 0.80 V$ ). [3]  
b) Explain the principle and procedure of potentiometric titration of NaOH Vs HCl. [3]  
c) Mention any two applications of adsorption. [2]



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