

**M.Tech. I Semester Degree Examination, April/May - 2024****MINERAL PROCESSING****Analysis of Ores and Minerals****(NEP)**

Time : 3 Hours

Maximum Marks : 70

**Note :** Answer **any five** of the following questions with Question No. **1 (Q.1)** is **Compulsory**.  
Each question carries **equal** marks.

- 
- |    |     |   |   |
|----|-----|---|---|
| 1. | (a) | Define sampling and write the types of sampling.  | 5 |
|    | (b) | What is the principle involved in ion exchange separation mechanism?                          | 5 |
|    | (c) | Briefly explain chromatography.   | 4 |
| 2. | (a) | Discuss the theory of Redox titration with suitable example.                                  | 4 |
|    | (b) | Explain the theory involved in Gravimetric titration.   | 5 |
|    | (c) | Write a note on digestion of precipitate.   | 5 |
| 3. | (a) | Write down the principle of electro-gravimetry analysis.                                      | 4 |
|    | (b) | List out the application of fire assaying in analysis of metals.                              | 5 |
|    | (c) | Discuss theory of Proximate analysis.   | 5 |
| 4. | (a) | Write the principle involved in flame emission spectroscopy.                                  | 4 |
|    | (b) | Discuss the instrumentation of atomic absorption spectroscopy.                                | 5 |
|    | (c) | List out the applications of calorimetry.   | 5 |
| 5. | (a) | Write the principle involved in the atomic absorption spectroscopy.                           | 4 |
|    | (b) | Write the principle involved in spectro photometry.   | 5 |
|    | (c) | Discuss the curve of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ .                              | 5 |
| 6. | (a) | Write the principle involved in the differential thermal analysis.                            | 4 |
|    | (b) | Discuss the theory of thermogravimetry analysis.  | 5 |
|    | (c) | State Bragg's law and explain the principle of X-ray of diffraction.                          | 5 |
| 7. | (a) | What are R-V lines? Explain their importance in qualitative analysis.                         | 5 |
|    | (b) | Describe the instrumentation and working of electron microprobe.                              | 5 |
|    | (c) | How is limestone ore analysed?  | 4 |
| 8. | (a) | Discuss the theory of x-ray fluorescence.   | 5 |
|    | (b) | Explain with an example how spectro-photometric method can be used for Quantitative analysis. | 4 |
|    | (c) | Discuss the theory of Electron microprobe analyser.   | 5 |

