

Total Pages—4

B.Tech-5th

(Set-T₁)

Principle of Extractive Metallurgy

Full Marks : 70

Time : 3 hours

Answer six questions including Q. No. 1
which is compulsory

The figures in the right-hand margin indicate marks

Symbols carry usual meaning

1. Answer *all* questions : 2 × 10
- (a) Write down the chemical formula of Galena.
 - (b) Write down the two important ores of Tungsten.
 - (c) Differentiate between ore and mineral.
 - (d) What do you understand in the term slag ?
Give suitable example.
 - (e) Differentiate between roasting and calcinations.

(Turn Over)

(f) Which ore is suitable for bacteria leaching ?

(g) What do you understand by the term of froth flotation ?

(h) What are the various impurities with which lead ores are associated ?

(i) Give example of non-ferrous metals which are extracted by using blast furnace.

(j) Write down the chemical formula of Chalcopyrite and Cerusite.

2. (a) Define and explain the terms smelting and roasting. Explain why smelting of roasted copper ore is done. 5

(b) Explain the working of the furnace for smelting operations. 5

3. (a) Write down the salient features of an Ellingham Diagram. 5

(b) Write down all the invariant reactions in Fe-Fe₃C phase diagram and also, calculate the degree of freedom in each reaction. 5

4. (a) List the advantages of Pyrometallurgical process in vacuum atmosphere. 5
- (b) What do you understand in term of metallo-thermic reduction? Give suitable examples. 5
5. (a) Why is the leaching process important in Hydrometallurgical process? Explain the effect of oxygen in leaching process. 5
- (b) Discuss the effect of bacteria in the leaching process with proper example. 5
6. (a) Explain the Faraday's law electrolysis. 5
- (b) Differentiate between electroplating and electrowinning. 5
7. (a) Write down the steps for purification of crude metal produced in bulk. 5
- (b) Differentiate between roasting and smelting. What is matte smelting operation? 5

(4)

8. Write short notes on any two : 5×2

(i) Ion Exchange

(ii) Solvent Extraction

(iii) Predominance Area Diagram

(iv) Electrolysis of fused salt.
