This paper consists of 3 pages including the cover page

Instructions

1. Answer all questions
Question 1

a. Define and explain the following terms:
   (i) Metallurgy (ii) Mineral (iii) Ore and (iv) Gangue minerals (8 marks)

b. List 4 factors that determines tonnage production of metals (4 marks)

c. Explain 3 major processes used in extraction and refining of metals (6 marks)

d. Explain 3 classifications of Pyrometallurgy (7 marks)

(25 marks)

Question 2

a. Discuss the advantages of Pyrometallurgical methods of metal production. (6 marks)

b. Write chemical equations describing the roasting of sphalerite and the subsequent high-tempest reduction by C to give zinc metal. (8 marks)

c. Liquid-state processing in Pyrometallurgy involves melting of at least metal-containing phase and carried out at higher temperature: write a balanced equation showing all the reaction(s) that take place. (6 marks)

d. How to separate a parent metal from the impurities using selective dissolution in refining process. (5 marks)

(25 marks)
Question 3

a. Tertiary treatment is mostly used for nutrient removal; briefly explain how these nutrients are removed (6 marks)
b. What are the disadvantages of chlorination? (4 marks)
c. What is the definition of drug? (4 marks)
e. Briefly explain the classification of drugs (6 marks)
f. Give the function of drug quality administration (5 marks)

(25 marks)

Question 4

a. What is flocculation? Briefly explain how it is performed (5 marks)
b. According to your opinion is it safe to drink demineralised water? (5 marks)
c. Briefly explain one method of purifying water for municipal supplies (5 marks)
d. What is meant by the term hard water? Name the types of hard water and how do they differ from each other? (5 marks)
e. Describe the process occurring in a municipal sewage treatment plant that performs primary treatment (5 marks)

(25 marks)