

**UNIVERSITY OF FORT HARE**

**PAC 225**

**DEGREE EXAMINATIONS**

**NOVEMBER 2018**

**Time: 3 HOURS**

**Subject: PAC 225**

**Paper: Chemical Technology 1**

**Marks: 100**

**This paper consists of 3 pages including the cover page**

**Internal Examiner**

**Prof OO Okoh**

**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-temperature 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)