



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI AZIKIWE**  
**EXPRESSWAY, JABI - ABUJA.**  
**FACULTY OF SCIENCES**  
**DEPARTMENT OF CHEMISTRY**  
**2025\_2 EXAMINATIONS**

---

**COURSE CODE:** CHM417

**COURSE TITLE:** Industrial Chemical Processes II

**COURSE UNIT:** 2

**TIME:** 2 Hours

**INSTRUCTION:** Answer question one and any other two questions.

1a. Write short note on:

- |  |         |
|--|---------|
| i. Zone refining   | 3marks  |
| ii. Levigation   | 4marks  |
| b. Explain the term "Liquation".   | 4marks  |
| c. Discuss briefly on how to prepare potassium sulphate from Langbemite.                         | 3 marks |
| d. What are the attributes of ammonium phosphate fertilizer.                                     | 3 marks |
| e. Why would you subscribe to electrochemical processes.   | 4marks  |
| f. Expatiate on the steps involved in the preparation of SO <sub>2</sub> in the Contact process. | 6 marks |
| g. List the uses of Nitric acid.   | 3 marks |
| 2a. State the two main sources of sodium carbonate.  | 4marks  |
| b. Explain how urea is utilized in the soil.   | 8marks  |
| c. Discuss the Stengel process of producing fertilizer.  | 8marks  |
| 3a. List the processes involved in Ore pretreatment.   | 5marks  |
| b. Describe how metal ore is refined using:  |         |
| I. Poling  | 4marks  |
| II. Cupellation  | 5marks  |
| c. How many types of Portland cement are well recognized?  | 1mark   |
| d. Discuss High Early Strength (HES) Portland Cement.  | 5marks  |

4. Write on the following:

- |   |        |
|---|--------|
| a. Equivalent weight of a substance   | 5marks |
| b. Anode  | 2marks |
| c. Cathode  | 2marks |
| d. Electrolyte  | 4marks |
| e. Electrode  | 7marks |
| 5a. Describe the constituents of the cathode and the anode of the membrane cell process.                                    | 4marks |
| b. What are the advantages and limitations of membrane cell have in comparison to other processes.                          | 7marks |
| a. Write chemical equation to show chemical reactions that takes place in the Solvay process of producing sodium carbonate. | 9marks |