



NATIONAL OPEN UNIVERSITY OF NIGERIA
DEPARTMENT OF CHEMISTRY
NOVEMBER, 2021 EXAMINATIONS
2023_1 POP EXAMINATION

COURSE CODE: CHM 417

CREDIT UNIT: 2

COURSE TITLE: INDUSTRIAL CHEMICAL PROCESSES II

TIME: 2 HRS

INSTRUCTION: *Answer question 1 and any other 2 questions*

1. (a) Write a balanced equation for the electrolytic manufacture of Calcium. 4 Marks
 (b) Describe how Sodium nitrate is produced. 11½ Marks
 (c) List the main methods of producing Ammonium nitrate. 3 Marks
 (d) Explain concisely the process for the manufacture of the cheapest form of Phosphoric acid. 7½ Marks
 (e) State Micheal Faraday's laws of electrolysis 4 Marks

2. . Write short notes on the following:
 (a) Hand Picking 2 ½ Marks
 (b) Levigation 3 ½ Marks
 (c) Magnetic concentration 2 Marks
 (d) Calcination 7 Marks

- ii. Describe the advantages of hydrometallurgy over pyrometallurgy? (5 Marks)

- 3 a) Describe how to prepare the following compounds of industrial applications
 I. Monoammonium phosphate 10 Marks
 II. Diammonium phosphate 8 Marks.
 b) Outline any two main physical methods for refining metals. 2 Marks

4. a) Explain in detail the production of aqueous NaOH and chlorine gas using diaphragm electrolytic cell. 15Marks
 b) With suitable equation describe how a pure gold metal can be recovered from cyanidation process. (5 Marks)

- 5 (a) Highlight the four (4) stages of producing sodium carbonate. 4Marks
 (b) Describe the last two stages of producing sodium carbonate. 11Marks
 (c) State five (5) effects of calcination process on ore 5 Marks