

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN
INDUSTRIAL CHEMISTRY**

CHIN 221: INDUSTRIAL INORGANIC CHEMICALS

STREAMS: BSC (IND CHEM)

TIME: 2 HOURS

DAY/DATE: MONDAY 05/07/2021

8.30 A.M. – 10.30 A.M.

INSTRUCTIONS:

- Answer question **One** (Compulsory) and any other **Two** questions.

QUESTION ONE [30 MARKS]

- (a) Discuss the industrial manufacture of ammonia. **(6 marks)**
- (b) Describe the industrial production of low strength and high strength nitric acid. **(8 marks)**
- (c) Caustic soda is manufactured on an industrial scale using the membrane process.
- (i) Describe, with a diagram and relevant equations, the membrane process. **(6 marks)**
- (ii) State four advantages of the membrane process. **(2 marks)**
- (d) Describe the following methods of ore beneficiation. **(8 marks)**
- (i) Comminution (ii) Froth flotation

QUESTION TWO [20 MARKS]

- (a) Describe the industrial manufacture of sulphuric acid. **(6 marks)**
- (b) Explain the purpose of the following ore pretreatment processes. **(4 marks)**
- (i) Drying (ii) Calcination (iii) Roasting (iv) Agglomeration
- (c) Discuss the production of titanium using the Kroll process. **(10 marks)**

QUESTION THREE [20 MARKS]

- (a) State six uses of caustic soda. **(3 marks)**
- (b) Describe the industrial manufacture of soda-lime glasses. **(10 marks)**

- (c) Discuss, with the aid of relevant equations, the manufacture of steel using the basic oxygen converter. **(7 marks)**

QUESTION FOUR [20 MARKS]

- (a) Describe, with the aid of relevant equations, the Solvay process for industrial production of soda ash. **(6 marks)**
- (b) Discuss the industrial manufacture of Portland cement. **(10 marks)**
- (c) Describe industrial production and uses of argon. **(4 marks)**
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