THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A constituent of JKUAT)

Faculty of Applied and Health Sciences

DEPARTMENT OF PURE AND APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF TECHNOLOGY IN APPLIED CHEMISTRY SECOND YEAR

ACH 4305: INDUSTRIAL PROCESSES

SPECIAL/SUPPLEMENTARY EXAMINATION

February 2013 SERIES 2 HOURS

Instructions to candidates:

This paper consist of **FIVE** questions

Answer question **ONE** (compulsory) any other **TWO** questions

Question ONE

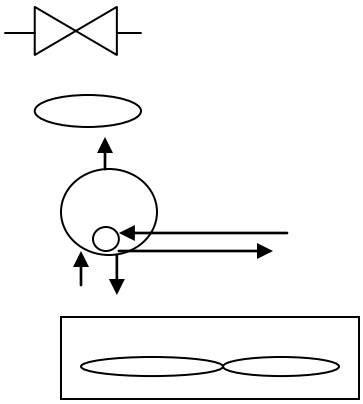
a) Give the meaning of the following symbols as used in a process flow diagram. **(4marks)**

i)

ii)

iii)

iv)



b) (i) Name any THREE essential equipments used in biofertiliser production **(3marks)**

(ii) Outline any THREE effects of the byproducts or wastes in the production of nitrogenous fertilizers. **(3marks)**

c) Give the importance of the following raw materials in paint production. **(3marks)**

(i) Iron oxide

(ii) Benzol

(iii) Anti-skinning agents.

d) Explain the effect of reducing temperature in the oxidation of ammonia. **(2marks)**

e) Explain why the resulting solution during the electrolys is of brine is alkaline. **(5marks)**

f) Explain the term steam reforming **(2marks)**

g) Explain the following processes as used in perfume production.

(i) Steam distillation **(3marks)**

(ii) Effleurage **(3marks)**

h) Differentiate between vodka and rum in terms of their raw materials. **(2marks)**

Question TWO

a) What is extractive metallurgy? **(2marks)**

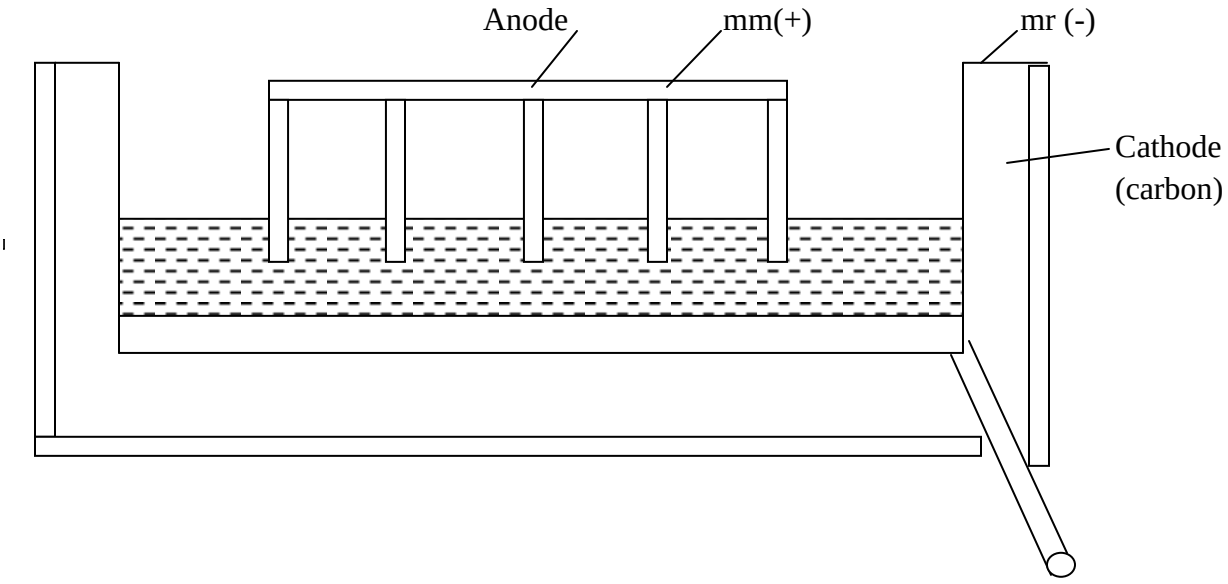
b) Using suitable equations, explain how the following impurities are removed in the extraction of iron.

i) SiO_2. **(2marks)**

ii) Al_2O_3 **(2marks)**

iii) Sulphur **(2marks)**

c) The following diagram is used in the electrolysis of Alumin study it and answer the questions that follow.



i) Explain what happens at the anode and cathode. **(4marks)**

ii) State any FOUR uses of aluminium. **(4marks)**

d) Describe the refining of copper by electrolysis. **(6marks)**

Question THREE

Explain the following processes as used in paper industry.

a) Pulp making. **(5marks)**

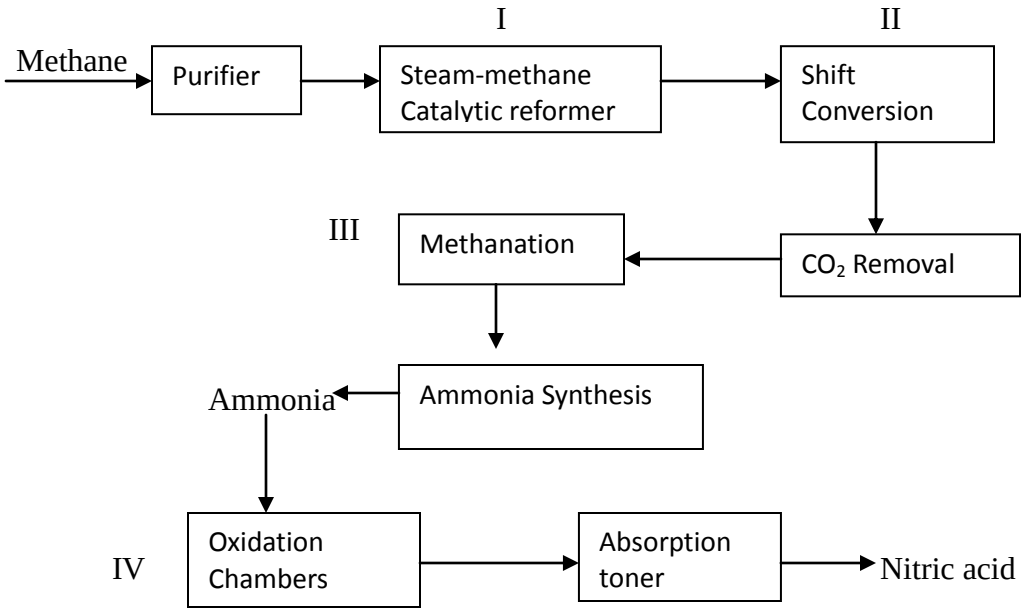
b) Beating. **(5marks)**

c) Pulp to paper. **(5marks)**

d) Finishing **(5marks)**

Question FOUR

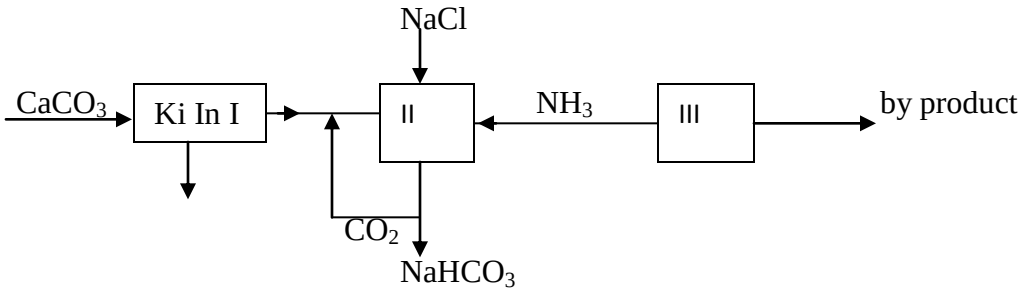
Study the flow diagram below and answer the questions that follow.



a) What happens in the purifier? **(2marks)**
b) Name THREE catalyst promoters in ammonia a product ion process. **(3marks)**
c) Write equations for the reactions in chambers I, II, and III. **(6marks)**
d) Explain the reactions in the following chambers
   (i) Oxidation **(6marks)**
   (ii) Absorption tower **(3marks)**

Question FIVE

The following flow diagram represents a section in the solvary process.



a) Using suitable equations explain the reactions taking place in chambers I, II and III. **(6marks)**
b) (i) Explain any FOUR classes of dyes on the basis of their uses **(8marks)**
   (ii) Outline any SIX methods of preventing and controlling pollution. **(6marks)**