



**NATIONAL OPEN UNIVERSITY OF NIGERIA  
UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI  
AZIKIWE EXPRESS WAY, JABI - ABUJA.**

**FACULTY OF SCIENCE**

**FEBRUARY/MARCH 2018 EXAMINATION**

**COURSE CODE: CHM 316**

**COURSE TITLE: INDUSTRIAL CHEMICAL TECHNOLOGY I**

**TIME: 2 HOURS**

**INSTRUCTION: Question one is compulsory. Answer question one and  
any other four questions.**

**QUESTION ONE**

1a) Write short note on the following:

- i.** Heat transfer
- ii.** First law of thermodynamics

5 marks

1bi) Mention two unit operations that employ heat transfer. 1 mark

1bii) Using boiling of water in open air, explain mass transfer by change of phase. 2 marks

1c) Draw a flow chart of physical processes of salt manufacture. 2 marks

1d) Discuss briefly gravitational separation. 6 marks

1f) Write a short note on mass transfer. 9 marks

## **QUESTION TWO**

Highlight and discuss briefly modes of mass transfer. 15 marks

## **QUESTION THREE**

Examine unit operations and unit process.15 marks

## **QUESTION FOUR**

Describe briefly the operating principles of distillation.15 marks

## **QUESTION FIVE**

Discuss briefly Adsorption, recrystallization and membrane filtration.15 marks