



**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