

**NATIONAL OPEN UNIVERSITY OF NIGERIA**

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

**FACULTY OF SCIENCES**

**DEPARTMENT OF PURE AND APPLIED SCIENCE**

**NOVEMBER 2018, SECOND SEMESTER EXAMINATION**

**COURSE CODE: CHM 316**

**COURSE TITLE: INDUSTRIAL CHEMICAL TECHNOLOGY I**

**CREDIT UNIT: 2**

**TIME: 2 Hours**

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

**QUESTION ONE**

Ia. Mention and explain briefly the basic laws which govern heat transfer. 131/2 marks

1b. Differentiate between unit operation and unit process. 3 marks

1c. With examples write short note on heater exchangers. 81/2 marks

**QUESTION TWO**

2. Highlight and discuss briefly modes of mass transfer. 15 marks

**QUESTION THREE**

3a. Write a short note on mass transfer. 9 marks

3b. Distinguish between mixing and agitation. 5 marks

3c. Mention two (2) examples of separators. 1 mark

**QUESTION FOUR**

4. Describe briefly the operating principles of distillation. 15 marks

**QUESTION FIVE**

5. Discuss briefly ;

1. Adsorption (3 marks)
2. Recrystallization (6 marks)
3. membrane filtration (6 marks)