



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
FIRST SEMESTER EXAMINATION 2021.

COURSE CODE: CHM316
COURSE TITLE: INDUSTRIAL CHEMICAL TECHNOLOGY I
TIME: 2 Hours
INSTRUCTION: Answer question one and any other three questions.

QUESTION ONE

- (1a) Draw a hypothetical block diagram to show the arrangement of size reduction equipment in a mining operation in quarry **(6mks)**
- (1b) Discuss the applications of crushers in mining operation **(9mks)**
- (1c) Explain two different types of convection. **(4mks)**
- (1d) Explain the following terms with respect to distillation operation: (i) Batch column and (ii) Continuous column **(6mks)**

QUESTION TWO

- (2a) Chemical reactors are designed by chemical engineers: Outline three objectives which the engineers put into consideration when designing reactors **(3mks)**
- (2b) Explain the following products as obtained from fractionating column in petroleum refining: distillate, side draw, and bottom products. Use a sketched diagram to illustrate your answer **(7mks)**
- (2c) Explain Eddy diffusion **(5mks)**

QUESTION THREE

(3a) Define the following **(6mks)**

(i) Azeotrope (ii) Distillation and (iii) Gravitational separation

(3b) With the aid of a sketched diagram, give a brief description of continuous stirred tank reactor **(9mks)**

QUESTION FOUR

(4a) Explain the term 'Extraction' **(3mks)**

(4b) Give three factors that must be taken into consideration to choose a suitable equipment for mixing liquids. **(3mks)**

(4c) Outline 3 different modes of mass transfer **(9mks)**

QUESTION FIVE

(5a) What is chemical technology? **(2mks)**

(5b) Give a brief discussion of four advantages of bioreactors **(6mks)**

(5c) Enumerate 5 basic considerations for designing a chemical process **(5mks)**

(5d) Differentiate between normal CSTR and chemostat **(2mks)**