



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI AZIKIWE**  
**EXPRESS WAY,**  
**JABI - ABUJA.**  
**FACULTY OF SCIENCES**  
**DEPARTMENT OF CHEMISTRY**  
**2024\_2 EXAMINATION.**

**COURSE CODE:** CHM 415  
**COURSE TITLE:** INDUSTRIAL CHEMICAL TECHNOLOGY II  
**COURSE UNIT:** 2  
**TIME:** 2 HOURS  
**INSTRUCTION:** Answer question one and any other two questions.

**QUESTION ONE**

- (1a) Enumerate the factors that increases the technical risk of an industrial chemical process (4 marks)
- (1bi) Give a detailed explanation of the meaning of glass (8 marks)
- (1bii) Mention at least four (4) physical properties of glass (4 marks)
- (1c) Itemize the advantages and disadvantages of plastics (4 marks)
- (1d) Briefly explain the optical properties of ceramics (10 marks)

**QUESTION TWO**

- (2a) Briefly discuss the mechanical and electrical properties of ceramics (8 marks)
- (2b) Mention the four major classes of plastics and give two examples of each (10 marks)
- (2c) Chemical processing is used to obtain high grade paper. Mentioned at least two types of pulps that are prepared via this process. (2 marks)

**QUESTION THREE**

- (3ai) Mention four (4) major causes of air pollution (4 marks)
- (3aii). Mention five (5) major air pollutants and two (2) minor air pollutant (7 marks)

(3b) Briefly discuss ceramics according to their field of use (9 marks)

#### **QUESTION FOUR**

(4a) Melting is one of the steps involved in the manufacturing of glass. Briefly explain it and list other steps (12 marks)

(4b) Briefly explain the formation of acid rain (8 marks)

#### **QUESTION FIVE**

(5a) Briefly discuss the applications of coal gasification (4 marks)

(5b) Extrusion and soft plastic forming are important methods of producing ceramics.

- i. Briefly discuss the two methods
- ii. Enumerate the techniques involved in soft plastic forming (16 marks)