



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**DEPARTMENT OF PURE AND APPLIED SCIENCES**  
**2021\_2 EXAMINATIONS**<sup>4678</sup>

**COURSE CODE:** CHM 312  
**COURSE TITLE:** INDUSTRIAL CHEMICAL PROCESSES 1  
**INSTRUCTION:** *Answer question 1 and any other 3 questions*

**CREDIT UNIT:** 2  
**TIME:** 2 HRS

**Question 1**

1. a. Define the following **[2 marks each= 14 marks]**
- i. Brewing.
  - ii. Malting
  - iii. Oenology
  - iv. Polymer
  - v. Monomer
  - vi. Polymerisation
  - vii. Adhesives
- b. Classify pesticides based on origin **[8 marks]**
- c. Name the three phases of industrial production of penicillin **[3 marks]**

**Question 2**

- 2a. Differentiate between thermosets and thermoplastics polymers **[8 marks]**
- b. State five unit operations techniques used in product recovering **[3 marks]**
- c. List four processes used during the process of manufacturing beer. **[4 marks]**

**Question 3**

3. a. Draw the structure of monosodium glutamate **[3 marks]**
- b. i. Write briefly on feeling factor **[2 marks]**
- ii. Outline six advantages of emulsion polymerisation over other polymerisation techniques **[6 marks]**
- c. Outline four specific features of enzymes? **[4 marks]**

**Question 4**

4. a. i. What is fermentation? **[2 marks]**
- ii. Give two types of flavouring agents **[2 marks]**

b. Use chemical equation to show the preparation of benzaldehyde

[5 marks]

c. Write briefly on the classification of explosives

[6 marks]

**Question 5**

5. a. i. What are antibiotics?

[2 marks]

ii. Outline five applications of polymers in industries

[5 marks]

b. Outline six ageing methods used in wine production

[6 marks]

c. Draw the structure of styrene-butadiene rubber

[2 marks]