



**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**  
**2023\_2 EXAMINATIONS**

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**COURSE CODE:** CHM302  
**COURSE TITLE:** POLYMER CHEMISTRY 1  
**TIME:** 2 HOURS  
**INSTRUCTION:** Answer question one and any other three questions.

**QUESTION ONE**

- 1a. In what way is monomer different from polymer and polymerization? 6 marks
- 1b. Name and explain the basic structural properties of polymer? 8 marks
- 1c. Discuss the importance of branched polymer molecule? 5marks
- 1d. Explain how strong carbon-carbon bonds in chain-growth polymers can be biodegraded? 6 marks

**QUESTION TWO**

- 2a. Differentiate between High-density polyethylene [HDPE] and Low-density polyethylene [LDPE] 8 marks
- 2b. Discuss the importance of Ziegler-Natta catalysts as an initiator in polymer chemistry? 5marks
- 2c. State the factors that determine the solubility of a polymer. 2 marks

**QUESTION THREE**

- 3a. Discuss the types of bonding that occur in polymers. 10 marks

3b. Explain the reason why hydrolysable stitches is used for biomedical applications. 3 marks

3c. Define the term crystallite.

2 marks

#### **QUESTION FOUR**

4a. Differentiate between solubility and solvolysis. 4 marks

4b. State the uses of two products of condensation polymerization. 4 marks

4c. Discuss the term degradation of polymer? 7 marks

#### **QUESTION FIVE**

5a. Polymers are designed synthetically to meet specific needs and desired impressions, state what should be taken into cognizance in the production of the appropriate polymer.

6 marks

5b. State why some polymers can be melted and reshaped. 3 marks

5c. Describe the production of polyethylene by the process of high degree technique. 6 marks