



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA**  
**FACULTY OF SCIENCES**  
**DEPARTMENT OF PURE AND APPLIED SCIENCE**  
**SEPTEMBER 2020\_1 EXAMINATION**

**COURSE CODE: CHM408**

**COURSE TITLE: Polymer Chemistry II**

**CREDIT: 2 Units**

**TIME ALLOWED: 2 Hours**

**INSTRUCTION: Answer Question ONE (1) and any other Three (3).**

- Q1. a) What is Polymerization? Hence, list two types of polymerization. **(4 marks)**  
b) (i) Briefly explain ionic Polymerization **(3 marks)**  
(ii) Define the following mechanical properties of polymer:  
Compressive strength and impact strength **(2 marks)**  
c) (i) Briefly explain polymer stereochemistry **(3 marks)**  
(ii) Mention two applications of natural rubber **(2 marks)**  
d) (i) List the different types of copolymers **(2 marks)**  
(ii) Define thermoplastic polymers **(3 marks)**  
e) Define polymer degradation **(3 marks)**  
f) List three physical properties of a polymer that can be identified by Differential scanning calorimetry. **(3 marks)**
- Q2. a) Give five characteristics of addition polymerization? **(5 marks)**  
b) Using chemical equation, describe condensation polymerization. **(4 marks)**  
c) Outline four types of polymer isomerism and explain any one. **(6 marks)**
- Q3. a) Describe the solution process when a polymer is added to a solvent **(5 marks)**  
b) Give Gibb's thermodynamic equation for describing a given system, defining each term. **(4 marks)**  
c) Mention at least three applications each of thermoplastic and thermosetting polymers. **(6 marks)**

Q4. a) Enumerate six benefits of polyurethane.

**(6 marks)**

b) List nine applications of polyurethane.

**(9 marks)**

Q5. a) Describe the term “phase equilibrium” in polymeric solutions.

**(7 marks)**

b) List the five factors that affect dissolution of polymers based on their chemical structures and explain one of the factors.

**(8 marks)**