



**National Open University of Nigeria**  
Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja  
**Faculty of Sciences**  
**Department of Pure & Applied Sciences**  
**January/February, 2018 Examination Questions**

**CHM408: Polymer Chemistry**

**CREDIT UNIT: 2 Units**

**TIME: 2 HOURS**

**INSTRUCTION: ANSWER QUESTION ONE & ANY OTHER THREE QUESTIONS.**

**QUESTION ONE**

- a. What is polymerization reaction? (5 marks)
- b. Enumerate any five properties each of addition polymerization and condensation polymerization. (10 marks)
- c. Highlight the properties of: i) thermoplastic and ii) thermosetting in terms of heat. (5 marks)
- d. Enumerate any five (5) factors which affect the mechanical properties of a polymer. (5 marks)

**QUESTION TWO**

- a) Distinguish between thermoplastics and thermosetting polymers. (10 marks)
- b) Mention at least ten applications each of thermoplastic and thermosetting polymers. (5 marks)

**QUESTION THREE**

- a) What is polymer degradation? (2 marks)
- b) Write short note on the following: oxidative degradation, thermal degradation, photolytic degradation, and hydrolytic degradation. (8 mark; 2 marks each)
- c) Give one polymer in each case that is degradable by each of the following degradation agents:  
i) ozone, ii) bioorganism, iii) oxygen, iv) water v) sunlight (5 marks)

**QUESTION FOUR**

- a) Explain briefly the two stages of solution process of polymers (5 marks)
- b) Discuss the effect of chemical structure on solubility of polymers. (10 marks)

**QUESTION FIVE**

- a) Describe any five simple identification tests for polymer. (10 marks)
- b) Write short notes on the following basic thermodynamic parameters: Enthalpy, Entropy and Gibbs' free energy. 3 marks
- c) Give a formula that connects these parameters together (in 5b above). (2 mark)

