

**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**

**JULY 2018 EXAMINATION**

**COURSE CODE: CHM 302**

**COURSE TITLE: POLYMER CHEMISTRY 1**

**COUSE UNIT: 2**

**TIME: 2 HOURS**

**INSTRUCTION: Question one is compulsory. Answer question one and**

**any other three questions.**

**QUESTION ONE**

1a)Differentiate between the following pairs of terms:

1. Polymer biodegradation and polymer degradation 5 marks
2. Natural and synthetic rubber 5 marks

1c) Using chemical equations only show the polymerization reaction of ethylene leading to the formation of polyethylene. 5 marks

1d Explain briefly the effect of the following on the solubility of polymers.

1. Temperature
2. Pressure
3. Polarity
4. Surface area 5 marks

1f) What effect does linear and branched chain have on a polymer? 5 marks

**QUESTION TWO**

Describe anionic addition chain-growth polymerization. 15marks

**QUESTION THREE**

3a) Write a short note on cross-linking. 61/2 marks

3b) What is the effect of vulcanization on natural rubber? 81/2 marks

**QUESTION FOUR**

4a**)** Distinguish between the following polymer configurations and what effects do they have on polymer properties:

1. Isotactic
2. Syndiotactic
3. Atactic

12marks

4b) Give three examples of natural and synthetic polymers. 3 marks

**QUESTION FIVE**

5a) Compare and contrast between elastomers and fibers. 12 marks

5b) Describe briefly copolymers. 3 marks