



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA**  
**FACULTY OF SCIENCES**  
**DEPARTMENT OF PURE AND APPLIED SCIENCE**  
**OCTOBER, 2019 EXAMINATION**

**COURSE CODE: CHM408**

**COURSE TITLE: Polymer Chemistry 2**

**CREDIT: 2 Units**

**TIME ALLOWED: 2 Hours**

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

- Q1. a) Explain the term “ion pair precipitation” in free radical polymerization (4 Marks)
- b) Dissolution of polymers depends on the crosslinking degree, explain? (4 Marks)
- c) With the aid of equation only, show the formation of polyurethane (4 Marks)
- d) Distinguish between good and bad solvent in thermodynamic of polymer (4 Marks)
- e) Draw the chemical notation of poly (ethylene terephthalate) (4 Marks)
- f) Why is Kevlar a condensation polymer? (3 Marks)
- g) Mention two uses of Kevlar in man’s daily activities (2 Marks)
- Q2. a) Explain “combination” and “disproportionation” in termination process (4 Marks)
- b) Distinguish between as isotactic polymers and syndiotactic polymers (4 Marks)
- c) Explain time factor and structure in mechanical properties of polymer (4 Marks)
- d) Enumerate three termination processes involved in anionic polymerization (3 Marks)
- Q3. a) Give the structures/names of two components use in production of Dacron (4 Marks)
- b) Define and describe copolymerization (4 Marks)
- c) Write simple equation for the synthesis of nylon 66 (4 Marks)
- d) Explain Beilstein test in direct polymer identification (3 Marks)
- Q4. a) What is rubber elasticity? Why is natural rubber sensitive to ozone cracking (5 Marks)

- b) What is weathering? List three major categories of polymer degradation (5 Marks)
- c) Itemize five environmental agents that affect polymer (5 Marks)
- Q5. a) State the full meaning of FTIR, NMR, XRD and DSC (4 Marks)
- b) Highlight any four advantages of copolymerization (4 Marks)
- c) In details, describe how a polymer get dissolved (7 Marks)