



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
FIRST SEMESTER EXAMINATION SEPTEMBER,2020_1

COURSE CODE: CHM 302
COURSE TITLE: POLYMER CHEMISTRY 1
COURSE UNIT: 2
TIME: 2 HOURS
INSTRUCTION: Answer questions one and any other three questions.

QUESTION ONE

- 1a) Explain the process and effect of
- i) Ozone cracking on natural rubber tubing?
 - ii) Chlorine attack on acetal resin plumbing joints (4Marks)
- 1bi) What is “faudree effect”? (2Marks)
- 1bii) Mention 5 elastic properties of “Elastomer” (9Marks)
- 1c) Explain addition polymers and condensation polymers (4Marks)
- 1d) State an acceptable definition of polymers (2Marks)
- 1e) State the economic importance of polylactic/polyglycolic acid (2Marks)
- 1f) State the characteristics of Fiber forming polymers (2Marks)

QUESTION TWO

- 2a) Using structural example, explain “Bakelite” and its formation (2Marks)
- 2b) What is cross-linking in polymer? (3Marks)
- (ii) What effect does it have on polymer? (5Marks)

2c) Explain the following co-polymer

- i) Block co-polymer (3Marks)
- ii) Grafted co-polymers (2Marks)

QUESTION THREE

3a) Explain the processes of production of liquid crystal (4Marks)

3b) Write short notes on

- i) Nematic liquid crystal (2Marks)
- ii) Smectic liquid crystal (3Marks)
- iii) Cholesteric liquid crystal (3Marks)

3c) Mention 3 effects branching has on polymer chains. (3Marks)

QUESTION FOUR

4a) State Henry's law of solubility of gaseous substances (6Marks)

4bi) Explain condensation polymerization using example (5Marks)

ii) State 3 factors that affect solubility of polymer substances (1½ Marks)

4c) List 5 examples of thermoplastic polymers (2 ½ Marks)

QUESTION FIVE

5a) Explain "Radical addition chain-growth polymerization" (8Marks)

5b) Write short note on cationic addition chain growth polymerization (3Marks)

5c) Discuss in details the anionic addition chain growth polymerization (4Marks)