



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 2021

COURSE CODE: CHM302
COURSE TITLE: POLYMER CHEMISTRY 1
TIME: 2 HOURS
INSTRUCTION: Answer question one and any other three questions.

QUESTION ONE

- 1a. Explain the three basic mechanisms by which addition chain-growth polymerization can occur. 6 marks
- 1bi. Define the term configuration of polymer. 1 mark
- 1bii. List the special types of branched polymer. 2marks
- 1biii. State the importance of long chain branches in polymer. 2marks
- 1c. Explain the two types of degradation of polymers to form smaller molecules using examples. 5marks
- 1d. Discuss the term cross linking and its effect during the addition of sulphur in vulcanization process on isoprene units in natural rubber [polyisoprene]. 9 marks

QUESTION TWO

- 2a. Rubber is naturally obtained as latex. Explain the terms natural rubber and synthetic rubber? 9 Marks
- 2b. Explain what happened when allylic positions on polymers with double bonds react?

6 marks

QUESTION THREE

3a. An initiator is used to start an addition chain-growth polymerization reaction, explain?

6marks

3b. State the causes of termination of the cationic addition chain-growth reaction?

4¹/₂ marks

3c. What is the role of a nucleophile in ionic addition chain-growth polymerization?

4¹/₂ marks

QUESTION FOUR

4a. Discuss how polymer is formed based on functional group(s) and number of types of monomers that form the polymer.

10¹/₂ marks

4b. Explain the basic differences between Elastomer and fibers

4¹/₂ marks

QUESTION FIVE

5a. Polarity is based on the principle that like dissolves like. Explain this statement using at least two examples?

5marks

5b. Why are Bakelites called thermosets?

5marks

5c. How do the principles liquid crystal operates for polymers?

5marks