



NATIONAL OPEN UNIVERSITY OF NIGERIA
14/16 AHMADU BELLO WAY, VICTORIA ISLAND, LAGOS
SCHOOL OF SCIENCE AND TECHNOLOGY
JUNE/JULY EXAMINATION

COURSE CODE: CHM302

COURSE TITLE: Polymer Chemistry I

TIME ALLOWED: 2 hours

INSTRUCTION: Answer only four questions

Question 1

- a) Differentiate between natural rubber and synthetic rubber. (5 marks)
- b) Enumerate five physical groups of polymers, with two examples each. (5 marks)
- c) Differentiate between the four copolymers ($7\frac{1}{2}$ marks)

Question 2

- a) What are basic chemicals? ($2\frac{1}{2}$ marks)
- b) In what way is addition chain-growth polymerization different from condensation step-growth polymerization? (9 marks)
- c) List three factors each that could cause the termination of chain growth in;
 - i) cationic addition chain reaction (3 marks)
 - ii) anionic addition (3 marks)

Question 3

- a) List and highlight factors that affect solubility of a solute in a solvent (10 marks)
- b) Differentiate between solubility and solvolysis ($7\frac{1}{2}$ marks)

Question 4

- a) Define Ziegler-Natta catalyst (2 marks)
- b) Differentiate between thermosets and thermoplastics (8 marks)
- c) List and explain five properties of polymer ($7\frac{1}{2}$ marks)

Question 5

- a) Discuss tacticity in polymer ($7\frac{1}{2}$ marks)
- b) Highlight the main differences between elastomers and fibers (10 marks)

Question 6

- a) List two factors that determines the rate of solubilization of a solute (5marks)
- b) Discuss the influence of named intermolecular forces on fibers (5marks)
- c) Describe crosslinking. What are the differences between the bonds formed in crosslinking and those formed in polymer synthesis?(7 $\frac{1}{2}$ marks)