

**NATIONAL OPEN UNIVERSITY OF NIGERIA**

**14/16 AHMADU BELLO WAY, VICTORIA ISLAND, LAGOS**

**SCHOOL OF SCIENCE AND TECHNOLOGY**

**JUNE/JULY EXAMINATION**

**COURSE CODE: CHM408**

**COURSE TITLE: POLYMER CHEMISTRY**

**TIME ALLOWED: 2 hrs**

**INSTRUCTION: Answer any four questions**

**Question 1**

a) Write short notes on the following:

i) Monomer ii) homopolymer iii) copolymer **(6marks)**

b) State five major differences between addition polymers and condensation polymers

**(7 marks)**

c) What are geometric isomers? Give two examples.  **(4 marks)**

**Question 2**

a) Identify the components of four condensation polymers and their uses  **(7 marks)**

b) Differentiate between tactic and atactic polymers. **(10 marks)**

**Question 3**

a) Differentiate between the types of polymer solvents. **(6marks)**

b) Discuss the solution process which occurs when a polymer is added to a solvent **(5marks)**

c) Explain how the following affects polymer solubility:

i) polarity ii) cross linking iii) molecular weight iv) branching **(6marks)**

**Question 4**

**a)** Discuss in detail the mechanical properties of polymers **(8marks)**

b) Enumerate five agents of degradation and likely susceptible polymers. **(5marks)**

c) Define polymer degradation and enumerate types of polymer degradation**. (4marks)**

**Question 5**

a) Give a detailed explanation of copolymerization. **(4marks)**

b) Mention the benefits of copolymerization **(4marks)**

c) List and discuss the different types of copolymers **(9marks)**

**Question 6**

a) Define the term chromatography **(3marks)**

b) Briefly write on the relevance of chromatography to the polymer industry **(4marks)**

c) State any three physical properties of polymer that can be identified by the following techniques: **(10 marks)**

i) infrared/FTIR ii) thermomechanical analysis

ii) differential thermal analysis iv) X-ray