NATIONAL OPEN UNIVERSITY OF NIGERIA
14-16 AHMADU BELLO WAY, VICTORIA ISLAND LAGOS
MARCH/APRIL 2016 EXAMINATION

SCHOOL OF SCIENCE AND TECHNOLOGY

COURSE CODE: **CHM302**
COURSE TITLE: **Polymer Chemistry 1**

Time: **2hours**
Answer question 1 and any three questions

QUESTION 1 (compulsory) 25marks

Ai. Explain the formation of Thermoplastic.(5 marks, 1 mark each for any 5 point given)

ii. Write the reaction showing the formation of Nylon (polyamide) and Dacron (polyester). (5marks)

B. i List the Eight guidelines taken into cognizance in the production of the appropriate polymerization. (8marks).

ii Write short note on Addition Polymerization reaction. (2marks)

iii Explain the Phillips process in the production of Polyethylene. (5 marks)

Question 2(15marks)

a i. A. Write short notes on the following: (10 marks)

I. Elastomers
II. Fibers
III. Resins
IV. Thermosetting

B i. State and explain the three stages in the mechanism of Addition polymerization reaction. (3 marks)

ii. List any four patterns by which Addition Polymerization can occur. (2 marks)

Question 3 (15 marks)

A i Explain the Effect of Temperature on Solubility. (6marks)

B. i State 6 starting materials from chemical industry and their use in polymer production. (6 marks)

ii Classify polymers based on their stereochemistry. (3 marks)

Question 4

A.i Define the term: Partition Coefficient. (1 mark)

ii. Outline the causes of the under listed addition chain growth reactions below:

a. Termination of the Cationic Addition- Chain growth reaction (3marks)

b. Termination of the Anionic Chain growth reaction (3 marks)

c. Termination of the Radical Chain growth reaction (3 marks)

B. Enumerate the effect of Crosslinking in Polymers. (5marks)

Question 5 (15 marks)

A. Explain the following addition polymerization reaction: (9 marks

i. Radical Addition Chain growth polymerization (3 marks)

ii .Cationic Addition Chain growth polymerization (3 marks)

iii. Anionic Addition Chain growth polymerization (3 marks)

B. Outline five major contributions of John Wesley Hyatt in Polymer. (6marks)

Question 6 (15 marks)

A. Write short notes on the following physical properties of Polymers:

i. Melting Point- (3 marks)

ii. Boiling Point- (3 marks)

iii. Biodegradation in Polymers(3 marks)

(9 marks)

B. Elucidate the Chemical properties of Polymers. (6 marks)