NATIONAL OPEN UNIVERSITY OF NIGERIA
University Village, NnamdiAzikiwe Expressway, Plot 91, Cadastral Zone, Jabi, Abuja
FACULTY OF SCIENCE

JULY 2017 EXAMINATION(POP)

COURSE CODE: CHM 408

COURSE TITLE: POLYMER CHEMISTRY

COURSE UNIT: 2 Units

TIME: 2 hours

INSTRUCTION: ***Answer question 1 and any other three questions***

Question 1

a) Describe any five simple identification tests for polymer. (***12 marks)***

b) Write short notes on the following basic thermodynamic parameters: Enthalpy, Entropy and Gibbs' free energy. ***4marks***

c) Give a formula that connects these parameters together. **(1 mark)**

d) Explainthe effects of each of the following on polymer solubility:

i) polarity ii) cross linking iii) molecular weight iv)branching
(2 marks each = **8 marks**)

Question 2

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

b) Mention the benefits of copolymerization (5 marks)

c) List and discuss the different types of copolymers. (6 marks)

Question 3

a) List and explain six properties of thermoplastics that distinguish them from thermosetting
bpolymers 6 MARKS

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

c).i. Explain with illustrations the meaning of polymer degradation.
ii. List the different types of polymer degradation you know.
(2 Marks each; 4 marks)

Question 4

a) Discuss in detail each of the following types of isomerism:

i) Orientational isomerism. **(3 $\frac{1}{2}$ marks)**

ii) Geometrical isomerism. **(3 $\frac{1}{2}$ marks)**

iii) Structural isomerism. **(3 $\frac{1}{2}$ marks)**

b) Differentiate between tactic and atactic polymers. **(4 ½ marks)**

5a) List any five instrumental techniques for polymer analysis. (5 marks)

5b) Discuss the five instrumental techniques for polymer analysis listed in (5a) above.(10 marks)