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

SCHOOL OF SCIENCE AND TECHNOLOGY

COURSE CODE: **CHM408**
COURSE TITLE: **POLYMER CHEMISTRY**

Duration: **2hrs**

Answer any four questions (each question carriers a total 17 $\frac{1}{2}$ marks)

Question 1

1a) List any four initiators in an anionic polymerization (4 marks)
b) Give the structure of the most commercially used initiator in an anionic polymerization (2 ½ marks)
c) State with relevant equations the four ways by which initiation process of an ionic polymeritiation can occur. (4 marks)
d) List and explain the benefits of co-polymerization (7 marks)

Question 2

a) Define polymer degradation and enumerate three broad classes of polymer degradation based on the agents causing degradation. (5 marks)
b) Enumerate five agents of degradation and one each likely susceptible polymers.
.c) Write short notes on the following: (5 marks)
i) monomer ii) homopolymer iii) copolymer

Question 3

a) What is meant by polyurethane? With equation show how polyurethane can be synthesize (5 ½ marks)
b) State any five properties of polyurethane
c) Explain briefly seven (7) advantages of polyurethane (7 marks)

Question 4

a) Explain how stretching of rubber affects entropy. (5 marks)

b) Discuss any seven (7) properties of thermoplastics which distinguish them from thermosetting polymers (7 marks)

c) With the aid of example (and equations) describe the mechanism of condensation polymerization. (5 $\frac{1}{2}$ marks)

Question 5

Discuss any five instrumental techniques used for identification and characterization of polymers.

Question 6

a) Describe the Industrial Important of any five Thermoplastics Polymers. (12 ½ marks)

b) Give the thermodynamic equation used for describing a given system defining each term (2 ½ marks).

c) What is the implication of negative Gibbs free energy change in solution process? (1 ½ mark)

d) What will be the effect of ΔH_m is positive, then $\Delta H_m < T\Delta S_m$ on solution process of polymer? (1 mark)