NATIONAL OPEN UNIVERSITY OF NIGERIA
UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESS WAY, JABI - ABUJA.

FACULTY OF SCIENCES

DEPARTMENT OF PURE AND APPLIED SCIENCES

FEBRUARY/MARCH2018 EXAMINATION

COURSE CODE: **CHM 302**

COURSE TITLE: **POLYMER CHEMISTRY 1**

TIME: **2 HOURS**

INSTRUCTION: **Question one is compulsory. Answer question one and any other three questions.**

QUESTIONONE

1ai)Polymers are macromolecule while all macromolecules are not polymers. Explain.
3 marks

1aii) Enumerate on the classes of polymers.11 marks

1b) Expatiate on condensation polymerization.5marks

1c) Account for the principle of liquid crystal nature of polymers.3 marks

1d) Explain briefly crystallinity in polymers.3 marks

QUESTION TWO

2a**)** Write short note on addition polymerization including the mechanism of its formation.

15 marks

QUESTION THREE

3a).How do the arrangements of molecules within a polymer and link between molecular chains in a polymer determine the properties, shapes and uses of the following:

i. Thermosets

ii.Thermoplastics

12 marks

3b) Will cross-links be possible in polyalkanes ? Give reason for your answer.

3 marks

QUESTION FOUR

Enumerate on the effect of chain length on the physical properties of polymers.

9 marks

Highlight the main differences between elastomers and fibers.6 marks

QUESTION FIVE

5a) Write short notes on the following types of linkages in polymers;

i. Linear alternating copolymers
ii Random or statistical copolymers
iii Block copolymers

11 marks

5b) Complete the following polymerization reactions;

1. $nCH_2= CH_2O_2$ initiator $\xrightarrow{1500atm,\ 2000^0C}$ 2 marks

2. $HOOC[CH_2]_4COOH + H_2N[CH_2]_6NH_2 - 2H_2O$ 2 marks