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

SCHOOL OF SCIENCE AND TECHNOLOGY

COURSE CODE: **CHM414**
COURSE TITLE: **Photochemistry and Pericyclic Reactions**

TIME: **2 Hours**
INSTRUCTION: **Answer any Four Questions**

QUESTION ONE

With the aid of chemical equations of photodissociation of stratospheric ozone and the destruction of ozone layer by CFCs, explain dissociation reaction.

($17^1/_2$ marks).

QUESTION TWO

a.) Write a short note on photochemistry induced by visible and ultraviolet light.

(8 marks)

b.) Discuss briefly the process of a photochemical reaction.

($9^1/_2$ marks)

QUESTION THREE

a.) State the characteristics of pericyclic reactions. (10 marks)

b.) Using the formation of cyclohexa – 1, 3 – diene by heating hexa – 1, 3, 5 triene as example explain electrocyclic reactions. ($7^{1}/_{2}$ marks).

QUESTION FOUR

a.) What are selective rules in photochemistry

($3^{1}/_{2}$ marks)

b.) Describe (i) the spin selection rule
(ii) La Porte selection rule .

(14 marks)

QUESTION FIVE

When a sample of 4-heptanone was irradiated with 313 nm light with a power output of 50 W under conditions of total absorption for 100 s, it was found that 2.8 $x10^{-3}$ mol C_2H_4 was formed. What is the quantum yield for the formation of ethane. Plank's constant = 6.63 x 10^{-34} J.Sec, speed of light (c) = 3x 10^{8} $m.sec^{-1}$

($17^{1}/_{2}$ marks).

QUESTION SIX

Discuss cycloaddition reactions using the reaction between 1, 3-butadiene and ethene.

($17^{1}/_{2}$marks).