



NATIONAL OPEN UNIVERSITY OF NIGERIA
14-16 AHMADU BELLO WAY, VICTORIA ISLAND LAGOS
SEPTEMBER/OCTOBER 2015 EXAMINATION
SCHOOL OF SCIENCE AND TECHNOLOGY

COURSE CODE: CHM 414:

COURSE TITLE: Photochemistry and Pericyclic Reactions

TIME: 2 Hours

INSTRUCTION: Answer any Four Questions

QUESTION ONE

- a.) Differentiate between thermal and photochemical reactions.
(7½ marks).
- b.) State and explain the 1st and 2nd laws of photochemistry.
(10 marks).

QUESTION TWO

- a.) Write a short note on photochemistry induced by visible and ultraviolet light.
(8 marks)
- b.) Discuss briefly the processes involved in a photochemical reaction.
(9½ marks)

QUESTION THREE

Discuss the Frank – Condon principle.
(17½ marks).

QUESTION FOUR

- a.) What are selection rules in photochemistry
(3½ marks)
- b.) Describe (i) the spin selection rule (7 marks)
(ii) Laporte selection rule (7 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 2.8×10^{-3} mol C_2H_4 was formed. What is the quantum yield for the formation of ethane. Plank's constant = 6.63×10^{-34} J.Sec, speed of light (c) = 3×10^8 m.sec⁻¹

(17½ marks).

QUESTION SIX

Discuss cycloaddition reactions using the reaction between 1, 3-butadiene and ethene.
(17½ marks).