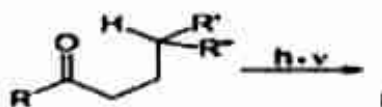


NATIONAL OPEN UNIVERSITY OF NIGERIA
UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESS WAY, JABI - ABUJA.
FACULTY OF SCIENCES
DEPARTMENT OF PURE AND APPLIED SCIENCE
2023 2 EXAMINATIONS

COURSE CODE: CHM414
COURSE TITLE: PHOTOCHEMISTRY AND PERICYCLIC REACTIONS
TIME: 2 HOURS
INSTRUCTION: Question one is compulsory. Answer question one and any other three questions.

QUESTION ONE

- a(i) Define the term radiative lifetime and write a mathematical expression for it. Can this lifetime be considered to be the actual lifetime of the excited state? Give reason (3 marks)
- (ii) What is population inversion (1 mark)
- (b) Present the consequence of interaction of the following radiation with matter
- (i) Radio wave (2 marks)
 - (ii) UV (2 marks)
 - (iii) Visible (2 marks)
 - (iv) X-ray (2 marks)
 - (v) Gamma ray (2 marks)
 - (vi) High energy gamma ray (2 marks)
- (c)(i) Differentiate between gamma ray and X-ray (3 marks)
- (ii) State which of the electromagnetic wave can be received by antenna (1 mark)
- (1d) Balance the following photochemical reaction (5 marks)



QUESTION TWO

- 2a. Discuss the roles of the following in photochemical experiments