



NATIONAL OPEN UNIVERSITY OF NIGERIA  
UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI AZIKIWE  
EXPRESS WAY, JABI - ABUJA.  
FACULTY OF SCIENCES  
DEPARTMENT OF CHEMISTRY  
2024 1 EXAMINATION

**COURSE CODE:** CHM 414  
**COURSE TITLE:** PHOTOCHEMISTRY & PERICYCLIC REACTIONS  
**COURSE UNIT:** 2  
**TIME:** 2 HOURS  
**INSTRUCTION:** ANSWER QUESTION NO. ONE (1) AND ANY OTHER TWO (2) QUESTIONS

**CONSTANT:** Speed of light =  $(3 \times 10^8 \text{ ms}^{-1})$

**QUESTION ONE**

- 1(a)(i) Describe the Angular momentum selection rule. (3 marks)
- (ii) Define the term "Luminescence" in photochemistry (2 marks)
- (iii) State any four (4) areas of application of photochemistry in everyday life (4 marks)
- (iv) Mention any two (2) radiations that are usually absorbed during photochemical reactions (2 marks)
- (b)(i) Two microwave frequencies are authorized for use in microwave ovens: 900 and 2560 MHz. Calculate the wavelength of each. (8 marks)
- (ii) Which frequency would produce smaller hot spots in foods due to interference effects? (2 marks)
- (c)(i) State the Kasha-Vavilove rule (2 marks)
- (ii) Mention any three (3) factors that the configuration of the products in pericyclic reaction depends on (3 marks)
- (d) Predict the cycloaddition product of the reaction

