NATIONAL OPEN UNIVERSITY OF NIGERIA
14/16 AHMADU BELLO WAY, VICTORIA ISLAND, LAGOS
SCHOOL OF SCIENCE AND TECHNOLOGY
MARCH/APRIL 2014 EXAMINATION

COURSE CODE: CHM 309
COURSE TITLE: ORGANIC SPECTROSCOPY
TIME ALLOWED: 2HOURS
INSTRUCTION: ANSWER ANY FOUR QUESTIONS

(speed of light =3.0 x 10^{8} ms^{-1} ,plancks constant = 6.626 x10^{-34} Js

1ai. What do you understand as ;i. Radiation 2mks

ii. Chromophore 2mks

b. Calculate the frequency of the number of peaks passing through a given point per second, if the wavelength between the peaks is 4 x10^{4}m. 6.5mks

c. Write short notes on the following: i. Spectroscopy 2mks

ii .Absorbance of UV/VIS radiation 2mks

iii. Bathrochromic shift 2mks

2ai. A radiation has an energy of 6.4 x 10^{12} .Calculate the wavelength? 10.5mks

b. Identify each parameter in this Beer Lambert Law equation. Log Io/It =A= εbc *4mks*

3. Briefly discuss the factors determining the absorption of radiation in the UV /VIS

b. Explain the terms, partition co-efficient and solubility of a drug. 6.5mks

4ai.Discuss the factors determining the intensity and energy level of absorption in IR – spectroscopy.10mks

b. List and explain two of the major components of UV- VIS spectrometer.7.5mks

5ai. Differentiate between a dispersive and fourier transform instruments.2mks

b. Using a calibration curve show a solution that obeys Beer lambert law and one that does not. 4mks

c. Discuss the three methods of sample preparation for an IR –spectrometer. 11.5mks

6a. Define the term mass spectrometry. 2.5mks

b. Discuss the methods of sample ionization. 15mks