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 309
COURSE TITLE: ORGANIC SPECTROSCOPY
TIME ALLOWED 2HOURS
(speed of light =3.0 x $10^{8}ms^{-1}$,plancks constant = 6.626 x10^{-34}Js)

QUESTION 1 COMPULSORY (25 marks)
(ai) Calculate the frequency of the number of peaks passing through a given point per second, if the wavelength between the peaks is 6 x10^{4}m. (7 marks)
b. A radiation has an energy of 6.4 x 10^{12} .Calculate the wavelength? 12mks
c. Define the following:
- i. Spectroscopy
- ii. Chromophores
- iii. Bathochromic shift

Question 2
a.Outline the Factors governing absorption of radiation in the UV/Vis region. 4marks

b. Write notes on the following:
i. Determination of Partition Coefficient of a drug.4marks
ii. Determination of solubility of a drug. 5marks
iii.Auxochromes. 2marks

Question 3
Ai Briefly discuss siting examples where necessary the following:
i. Intensity of absorption.(5 marks)
ii. Energy level of absorption.(5 marks)
iii.Themonochromator.(2 marks)
iv. The optics. (3 marks)

Question 4
a. Explain the different methods of sample preparation in IR spectroscopy.(13 marks)
b. What is finger print region and its use.(2 marks)

Question 5
Ai. What is mass spectroscopy?(7 marks)
b.Draw and label correctly the Michelson Interferometer.(8 marks)

Question 6
a. Mention five ionization techniques you know in mass spectroscopy.(5 marks)
b. Explain the following terms:
   - i. Mass analyser.
   - ii. Magnetic sector.
   - iii. Ion trap mass analyzer
   - iv. Quadrupole mass analyzer
   - v. Tandem mass analyzers