NATIONAL OPEN UNIVERSITY OF NIGERIA
14-16 AHMADU BELLO WAY, VICTORIA ISLAND LAGOS
MARCH/APRIL 2016 EXAMINATION

SCHOOL OF SCIENCE AND TECHNOLOGY

COURSE CODE: **CHM309**
COURSE TITLE: **ORGANIC SPECTROSCOPY**

TIME ALLOWED 2HOURS

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

Answer question 1 and any other three

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. (8 mks)

b. A radiation has an energy of 6.4 x 10^{12} .Calculate the wavelength? (12mks)

c. Briefly explain the following:

i. Spectroscopy (2mks)
ii. Chromophores (2mks)
iii. Bathochromic shift (1mk)

Question 2 (15 marks)

a.Outline the Factors governing absorption of radiation in the UV/Vis region. (4mks)

b. Write notes on the following:

i. Determination of Partition Coefficient of a drug. (4mks)
ii. Determination of solubility of a drug. (5mks)
iii.Auxochromes. (2mks)

Question 3 (15 marks)

Ai Briefly discuss siting examples where necessary the following:

i. Intensity of absorption.(5 marks)
ii. Energy level of absorption.(5 marks)
iii.The monochromator.(2 marks)
iv. The optics. (3 marks)

Question 4 (15 marks)

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

Question 6 (15 marks)

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 analyzer

    (2 marks for each)