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**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 108ms-1 ,plancks constant = 6.626 x10-34Js)

**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 x104m. (7 marks)

b. A radiation has an energy of 6.4 x 1012 .Calculate the wavelength? 12mks

c. Define the following:

1. Spectroscopy
2. Chromophores
3. 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

1. Mention five ionization techniques you know in mass spectroscopy.(5 marks)
2. Explain the following terms:
3. Mass analyser.
4. Magnetic sector.
5. Ion trap mass analyzer
6. Quadrupole mass analyzer
7. Tandem mass analyzers