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**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 108 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 x104m. (8 mks)

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

c. Briefly explain the following:

1. Spectroscopy (2mks)
2. Chromophores (2mks)
3. 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)

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 analyzer

(2 marks for each)