



**NATIONAL OPEN UNIVERSITY OF NIGERIA
14-16 AHMADU BELLO WAY, VICTORIA ISLAND, LAGOS
SCHOOL OF SCIENCE AND TECHNOLOGY
JANUARY/FEBRUARY 2013 EXAMINATION**

CHM 306: INSTRUMENTAL METHODS OF ANALYSIS

INSTRUCTION: ANSWER FOUR QUESTIONS ONLY

Duration: (Each question carries a total $17\frac{1}{2}$ marks).
2 hrs

Question 1

- a) Distinguish clearly between absorption and emission spectroscopy.
- b) State Beer's and Lambert's law
- c) A sample in a 1.0-cm cell is determined with a spectrometer to transmit 80% light at a certain wavelength. If the absorptivity of this substance at this wavelength is 2.0, what is the concentration of the substance?

Question 2

- a) Discuss the types of molecular vibration.
- b) State the two radiation source used in infrared spectrometry as well as their respective composition.
- c) State the application of infrared spectrometry.

Question 3

- a) Compare and contrast between flame emission and flame absorption spectroscopy.
- b) Outline major types of interferences encountered in atomic absorption analysis and describe how such problems can be overcome.

Question 4

- a) Outline four application of X-ray fluorescence analysis.
- b) Outline seven application of fluorimetry.
- c) What is meant by each of the following:
i) Quenching ii) Fluorescent filter iii) Monochromator

Question 5

- a) What advantages does coulometric has over the conventional titration.
- b) Outline five general applications of coulometric methods.
- c) State the five applications of refractometer.
- d) What is meant by refraction and refractive index?

Question 6

- a) What is meant by each of the following:
i) Specific conductance
ii) Molar conductance
- b) Explain the basic principles of conductimetric analysis.

- c) With the aid of a good diagram, describe the basic instrumental design of a conductivity meter.**

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