



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

SCHOOL OF SCIENCE AND TECHNOLOGY

COURSE CODE: CHM 306:
COURSE TITLE: Instrumental Methods of Analysis

Time: 2 Hours

INSTRUCTION: Question one is compulsory, answer question one and any other three questions.

QUESTION ONE

- a) Describe electromagnetic radiation.
- b) What are optical methods of analysis?
- c) State and explain the types of optical methods of analysis. (25 marks)

QUESTION TWO

- (a) State the region of the electromagnetic spectrum associated with the following spectroscopic techniques.
 - i Electronic spectroscopy
 - ii Vibrational Spectroscopy
 - iii Rotational Spectroscopy
- b.) What do you understand by the following terms?
 - i. Absorbance
 - ii. Transmittance.
- c.) Show and state the relationship between absorbance and transmittance.

(15 marks).

QUESTION THREE

Explain how the concentration of a coloured sample can be estimated by colorimetry. (15 marks)

QUESTION FOUR

Write briefly on absorption of radiation and emission of radiation. (15 marks)

QUESTION FIVE

- i.) Enumerate the types of molecular vibrations experienced by molecules when they absorb infrared radiation.
- (ii) Discuss finger print region. (15 marks)

QUESTION SIX

Explain the working principle of flame emission and flame atomic absorption spectroscopy. (15 marks)