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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: 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**

1. 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**

1. 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)