



NATIONAL OPEN UNIVERSITY OF NIGERIA
University Village, Plot 91 Cadastral Zone, Nnamdi Azikiwe Express Way,
Jabi - Abuja.
FACULTY OF SCIENCES
DEPARTMENT OF PURE AND APPLIED SCIENCES
JULY 2017 EXAMINATION

COURSE CODE: CHM 306
COURSE TITLE: INSTRUMENTAL METHODS OF ANALYSIS
COURSE UNIT: 2 Units

TIME: 2 HOURS

INSTRUCTION: Question one is compulsory. Answer questions one and any other three questions.

1ai) Describe the electromagnetic radiation.
(8 marks)

1aii) What happens when radiation and matter interact?
(3¹/₂ marks)

1aiii) State the laws of the absorption of light radiation by solutions and what information can be obtained from these laws.
(3 marks)

1bi) Discuss the basic concept of X-ray diffraction method.
(4¹/₂ marks)

1bii) Mention one application of X-ray diffraction method.
(1 mark)

1ci) Explain the basic concept of conductimetry.
(4 marks)

1cii) Highlight the major application of conductimetry (1 mark)

2ai) What is infrared spectroscopy?
(1¹/₂ marks)

2a) How would you determine the functional groups present in an organic molecule using infrared spectroscopy? (8 marks).

2b) Distinguish between Infrared spectrometer and Fourier Transformer Infrared spectrometer.

(5½ marks)

3a) Write short note on fluorescence spectroscopy. (5 marks)

3a) List the compounds that can be determined by fluorescence spectroscopy. (4 marks)

3b) State two factors that can increase the efficiency of fluorescence in a compound. (3 marks)

3b) Mention two applications of fluorescence spectroscopy. (3 marks)

4a) What information can be obtained from measuring the refractive index of a compound using a refractometer? (5½ marks)

4a) Describe how the refractive index of a compound can be determined using a refractometer.

(7 marks)

4b) Based on the nature of the radiation that is been absorbed or emitted, mention types of spectroscopy. (2½ marks)

5a) With the aid of a well labelled schematic diagram, expatiate on the working principle of Flame Atomic Absorption Spectroscopy. (13½ Marks).

5b) Give one application of Flame Atomic Absorption Spectroscopy. (1½ marks)

