NATIONAL OPEN UNIVERSITY OF NIGERIA
UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESS WAY, JABI - ABUJA.

FACULTY OF SCIENCE

OCTOBER/ NOVEMBER 2016 EXAMINATION

COURSE CODE: CHM 306
COURSE TITLE: Instrumental Methods of Analysis
CREDIT UNIT: 2
Time: 2 Hours
INSTRUCTION: Answer any Four Questions

QUESTION ONE

Write briefly on absorption of radiation and emission of radiation.

($17^1/_2$ marks).

QUESTION TWO

Enumerate on the types of molecular vibrations experienced by an organic molecule when it absorbs infrared radiation. ($17^1/_2$ marks).

QUESTION THREE

a) State the laws of the absorption of light radiation by solutions and show mathematically these laws. (11 marks).

b) Calculate the concentration of a sample solution whose absorbance and molar absorptivity at 270nm is 1.92 and 19400 respectively. ($6\ ^1/_2$ marks).

QUESTION FOUR

a) Explain briefly Colorimetry. (6 marks).

bi) What are spectrophotometers . (2 marks).

bii) Sketch a simple schematic diagram of a typical spectrophotometer. ($2^1/_2$ marks).

biii) Explain briefly the function of the components of the spectrophotometer sketched. (7 marks).

QUESTION FIVE

a.) Discuss the basic concept of X-ray diffraction method. (12 marks).

b.) Give reasons why atoms are able to produce diffraction patterns in X- ray diffraction method. ($5\ ^1/_2$ marks).

QUESTION SIX

a.) Distinguish between the following terms used in Flame Atomic Absorption Spectroscopy

i. Interference
ii. Sensitivity
iii.
iv. Detection Limit

($9\ ^1/_2$ marks).

b.) State one use of each of the following

I. Infrared spectroscopy
II. X- ray diffraction method
III. Flame Emission and Flame Atomic Absorption Spectroscopy
IV. Nuclear Magnetic Resonance Spectroscopy

(8marks).