ELIZADE UNIVERSITY,

ILARA-MOKIN,

ONDO STATE

FACULTY: BASIC & APPLIED SCIENCES

DEPARTMENT: BIOLOGICAL SCIENCES

FIRST SEMESTER EXAMINATION

2016/2017 ACADEMIC SESSION

COURSE CODE: EMT 303

COURSE TITLE: METHOD OF ENVIRNMENTAL ANALYSIS II

DURATION: 2 HOURS

HOD'S SIGNATURE

NAME:.....MAT. No:.....

INSTRUCTION
ANSWER QUESTION ONE (1) AND ANY OTHER TWO QUESTION.

1 a. What do you understand by the terms electromagnetic radiation (EMR) and electromagnetic spectrum (EMS)

b. List the three types of energy changes accompanying absorption of EMR and explain two

c. Explain the principle of UV / Visible absorption spectrophotometry

d. Draw a labeled schematic diagram of a double beam UV / visible spectrophotometer and briefly describe the working of the instrument.

e. A sample in 1 cm cell is determined with a spectrophotometer to transmit 65 % light at a wavelength of 520 nm. If the molar absorptivity at this wavelength is 3.00 L mol^{-1} cm^{-1}.Calculate the absorbance and concentration of the sample.

f. Mention the light sources for a UV/ visible spectrophotometer and three applications of UV / visible spectrophotometry

2 a. What are Chromophores and Auxochromes .Give two examples in each case

b. Define Beer-Lambert's law and list the deviations from Beer- Lambert's law

c. List THREE limitations and TWO applications of Flame atomic Emission Spectrophotometry

d. What are Bathochromic and Hypochromic shifts

3 a. Infra-red region of the EMS is divided into three regions, list the regions (with their ranges) and which of the regions is the most analytically useful

b. What are the two modes (types) of molecular vibrations in molecules that are infra-red active and list the different types of these modes

C. Calculate the number of possible theoretical vibrational modes for a non - linear Ethyl methyl ketone (CH3- CH2-CO-CH3) and a linear carbon dioxide molecule

D. What are the light sources for Infrared Spectroscopy?

4a. Briefly describe the preparation of solid samples for infra-red spectroscopy

b. In which region of the infrared spectrum is the finger print region and what is the importance of this region

c. What are the light sources employed in Atomic Absorption Spectrophotometry

d. Sketch a typical titration curve for the titrat: on of colourless (non-absorbing) reactants to give an absorbing product e. g Titration of Cu (II) w: h EDTA. $\varepsilon_A = \varepsilon_T = 0$, $\varepsilon_P > 0$

5 a. Explain the principle of flame photometry

b. Draw a schematic structure of a laminar fla ne showing different zones

c. Following nebulization of sample into flan e in Flame Atomic Emission Spectrophotometry (FAES), List the five processes that occur in th flame in stepwise order and briefly explain three of the processes

d. List the types of interference in flame phot metry and explain one of the interference and its elimination