



NATIONAL OPEN UNIVERSITY OF NIGERIA
14-16 AHMADU BELLO WAY, VICTORIA ISLAND LAGOS
SEPTEMBER/OCTOBER 2015 EXAMINATION
SCHOOL OF SCIENCE AND TECHNOLOGY

COURSE CODE: ESM 341

COURSE TITLE: INTRODUCTION TO INSTRUMENTATION MEASUREMENTS AND FIELD METHODS IN ENVIRONMENTAL SCIENCE .

Answer question one and any other three questions

Question 1 Compulsory (25 marks)

1a. Define the following: i. Instrumentation. 2mks

ii. Specialized techniques. 2mks

iii. Universal techniques. 2mks

bi. List 5 examples of field and laboratory equipments that use remote sensing technique. (5marks)

ii. State the particular requirements in a particular application that the selection of a technique will be based on. (4marks)

(c). Write short notes on the remote sensing equipments.

i. Spectrometer (2marks)

ii. Colorimeters (2marks)

iii. Total station (3marks)

iv. Global positioning systems (3marks)

2a. What are composite variables and give two examples? 3mks

ii. Explain the terms pH and electrical conductivity. (4marks)

bi. Mention some environmental factors that affect pH and EC measurements. 2 marks

c. Briefly discuss how the pH and electrical conductivity of a soil sample can be detected. 6mks

3. With the aid of a well labelled diagram represent a typical block Atomic Absorption Spectrophotometer (AAS). (8marks)

b. Outline and state the uses (where necessary) the essential parts of a colorimeter. (7marks)

4ai. Mention and explain in details the basic causes of sampling error. (8marks)

b. Enumerate the sample history documentation and procedures requirements. (7marks)

5a. Explain the following: (6marks)

i. Sampling

ii. Population

iii. Sample.

bi. Define the three types of samples. 6mks

ii. Outline the three steps in turning a liquid sample into an atomic gas in an AAS spectrometry. 3marks

6ai. Outline the main reasons for sampling. 6mks

b. Mention five things a sample method and procedure documentation must include. (10 marks)