



National Open University of Nigeria
Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja
Faculty of Science
2022_1 EXAMINATIONS

COURSE CODE: ESM341

COURSE TITLE: Introduction to Instrumentation Measurement and Field Methods in Environmental Science

CREDIT: 2Units

TIME ALLOWED: 2 Hours

Instruction: Attempt question number ONE (1) and any other TWO (2) questions. Question number one (1) carries 30marks, while the other questions carry (20) marks each.

- 1a Describe instrumentation for field observation; a method of data acquisition (4 marks)
- 1b Discuss the attributes of laboratory techniques (4 marks)
- 1c Define remote sensing according to Campbell (1996) (2 marks)
- 1d Draw and label the process of the remote sensing technique (5 marks)
- 1e Write short notes on Total Station (5 marks)
- 1f Draw and label a Total Station (10 marks)

- 2a Explain the choice of Quadrat size for different types of survey (6 marks)
- 2b Discuss the adoption of systematic sampling of species in an area of study (6 marks)
- 2c Describe the use of a Quadrat survey (4 marks)
- 2d Define pH of a body of water (4 marks)

- 3a How are electrical conductivity of a body measured? (3 marks)
- 3b Describe any two protocols of measuring pH of a liquid using pH Meter (4 marks)
- 3c Discuss protocol of measuring soil electrical conductivity (5 marks)
- 3d Draw and label the Atomic Absorption Spectrophotometer (8 marks)

- 4a Describe the colorimetric analysis (5 marks)
- 4b Define and explain the technique of mass spectrometry (5 marks)
- 4c Define and describe the processes of gas chromatography (5 marks)
- 4d Write short notes on any of the integrated air samplers (5 marks)

- 5a Briefly discuss the following reasons for sampling instead of census:
 - i. The economic advantage (5 marks)
 - ii. The time factor (3 marks)
- 5b Differentiate between a simple random sample and a systematic random sample
(5 marks)
- 5c Enumerate any six (6) items that should be in the checklist of each sampling trip
(3 marks)
- 5d Explain the two main characteristics of sound level meter (4 marks)