National Open University of Nigeria
Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja
Faculty of Science
2023_1 POP EXAMINATION

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)