



**National Open University of Nigeria**  
**Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja**  
**Faculty of Science**  
**2020\_1 EXAMINATIONS**

**COURSE CODE: ESM 341**

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

**CREDIT: 2 Units**

**TIME ALLOWED: 2 Hours**

**Instruction:** Attempt question number ONE (1) and any other THREE (3) questions. Question number one (1) carries 25 marks, while the other questions carry (15) marks each.

- 1a) Summarize the working principle of fritted bubblers. **(6 marks)**
- 1b) Identify three samplers that are used in biological sampling of freshwater. **(6 marks)**
- 1c) Briefly explain the importance of a noise dosimeter. **(9 marks)**
- 1d) Give three significant reasons why belt transect is more desirable than line transect **(4marks)**
  
- 2a) What are the major functions of the midget impinger wash bottle. **(2marks)**
- 2b) List four significant features of a graphic level recorder **(4 marks)**
- 2c) State the criteria for the selection of a tape recorder. **(9marks)**
  
- 3a) What is the reason behind the collection of replicate samples? **(1 mark)**
- 3b) Electrical conductivity and pH are influenced by certain environmental factors; state four of these factors. **(4 marks)**
- 3c) The design of a mass spectrometer has three important modules; list all these modules and the function of each one. **(3 marks)**
- 3d) Give a brief and lucid description of the sound level meter. **(4 marks)**
- 3e) State three steps by which a liquid sample can be turned into an atomic gas **(3marks)**
  
- 4a) Define sunshine duration **(2mark)**
- 4b) List four types of fixed meteorological stations and describe each of the meteorological stations listed above. **(8marks)**
- 4c) Explain the mode of operation of Vacutainer syringe system. **(5 marks)**
  
- 5a) Explain how soil pH can be measured using a pH meter? **(2 marks)**
- 5b) State five advantages of sampling in a study **(5 marks)**
- 5c) List four advantages of Vacuitaner syringe system **(4 marks)**
- 5d) Mention four types of microphone. **(4 marks)**