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**NATIONAL OPEN UNIVERSITY OF NIGERIA**

Plot 91, Cadastral Zone, Nnamdi Azikwe Expressway, Jabi, Abuja

**FACULTY OF SCIENCES**

**OCTOBER/NOVEMBER EXAMINATION 2016**

**COURSE CODE: ESM341 TIME: ALLOWED: 2HRS**

**COURSE TITLE: INTRODUCTION TO INSTRUMENTATION MEASUREMENTS AND FIELD METHODS IN ENVIRONMENTAL SCIENCE CREDIT UNIT: 2**

**Instructions: 1. Attempt question Number one (1) and any other three (3).**

**2. Question number 1 is compulsory and carries 22 marks, while the other questions carry equal marks (16) each**

 **3. Present all your points in coherent and orderly manner**

**1a**. Briefly discuss the scope of instrumentation in environmental science **(10 marks)**

**1b.** Define instrumentation **(3 marks**): With examples, mention the instrumentation for field observation and laboratory analysis **(9 marks**) TOTAL **(22 marks)**

**2.** Define Remote Sensing; Explain briefly any five of the processes of the remote sensing techniques **(16 marks)**

**3a.** Discuss the concept of Global Positioning System (GPS) **(6 marks)**

**3b.** Discuss the preparation for each sampling trip **(10 marks)**

**4.** Write short notes on any four of the following laboratory techniques and instrumentation

1. Chromatography **(4 marks)**
2. Mass Spectrometry **(4 marks)**
3. Colorimetric Analysis **(4 marks)**
4. Atomic Absorption Spectrophotometer ‘AAS’ **(4 marks)**
5. Random Sampling **(4 marks) Total (16 marks)**

**5.** Briefly describe the two types of meteorological station and discuss in details the four meteorological variables and their techniques of measurement (**16 marks)**

**6.** Give an explanatory note on any four of the following:

**a**. Magnetic Tape Readers **(4 marks)**

**b.** Use of a Tape Recorder **(4 marks)**

**c.** Calibrator **(4 marks)**

**d.** Noise Dosimeter **(4 marks)**

**e.** Microphone **(4 marks) Total (16 Marks)**