

**FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION
DEPARTMENT OF INDUSTRIAL & TECHNOLOGY EDUCATION**

FIRST SEMESTER 2019/2020 SESSION EXAMINATION

COURSE TITLE/CODE: Measuring Instrument and Testing (ITE 351)
TIME ALLOWED: 2 Hours
INSTRUCTION: Attempt (4) questions, question 1 is compulsory.

Question 1: Using a neat diagram of megger meter explain its working principle, state three (3) advantages and two (2) disadvantages of Electronic Type and Manual Type Operated megger meter.

Question 2: Using relevant diagrams explain the working principle of Permanent Magnet Moving Coil (PMMC) instrument and Moving Iron (MI) instrument.

Question 3: Explain the following terms using diagrams where applicable

- I. Damping device
- II. Controlling device
- III. Deflecting device

Question 4: Using neat label diagram Explain the construction and working principle of:

- i. Electrodynamic meters
- ii. Hot-wire ammeter and voltmeter

Question 5I: Explain the working principle of digital meter

- II. A moving coil instrument of resistance of $30k\Omega$ gives a full scale deflection in the coil, current of 250mA. Calculate with aid of circuit the value of the shunt to be connected in parallel to enable it to be used as an ammeter for measuring current up to 40A

Question 6I: Briefly explain the following terms

- a. Direct method of measurement,
- b. Indirect method of measurement
- c. Residual errors
- d. Environmental error
- e. Instrument error

- I. Outline seven (7) conditions govern the choice of measuring instrument.