FEDERAL UNIVERSITY OF TECHNOLOGY MINNA, NIGER STATE
DEPARTMENT OF INDUSTRIAL & TECHNOLOGY EDUCATION
FIRST SEMESTER EXAMINATION 2021/2022 SESSION

Course Title/Code: Electrical Measuring Instrument and Testing/ITE 351
Credit Units: 2
Time Allowed: 2 hours
Instruction: Attempt 4 questions.

1a. Explain the following terms (1) Battery, (2) Cell, (3) Direct method of measurement (4) Indirect method of measurement (5) Deflecting method of measurement(5marks).
1b. With good label diagram explain Hot wire ammeter instrument (5 marks),
1c. Using neat label diagram, explain in details the principal operation of Permanent Magnet Moving Coil (PMMC) (5marks).

2a. Using well label diagram, explain the general principle of operation of battery (5marks)
2b. List and explain in details three factors that cell voltage depends on (5marks)
2c. A moving instrument gives f.s.d for a current of 5mA neglecting the resistance of the instrument. Calculate with aid of circuit the approximate value of series resistance needed to enable the instrument to measure up to 500V.(5marks).

3a. Using neat label diagram megger meter explain ~~the~~ working principle (8marks)
3b. with appropriate diagram differentiate between attraction type moving iron instrument and reportion type moving iron instrument (7marks).

4a. Construct a battery bank of 10 batteries having 15V and 5Ah each to produce 50V and 10Ah and determine its energy capacity (5marks).
4b Using relevant diagrams explain the following. 1, damping torque 2, deflecting torque and 3, controlling torque (10marks).

5a. A moving coil instrument of resistance of 40KΩ gives a full-scale deflection in the coil, current of 480mA. Calculate with aid of circuit the value of the shunt resistance to be connected in parallel to enable it to be used as an ammeter for measuring current up to 60A (5marks).
5b. List and explain five (5) factors that govern the choice of an instrument for a particular measurement situation (5marks).
5c. With a neat label diagram explain the working principle of digital measuring instrument (5marks).