Reg. No. ☐☐☐☐☐☐☐☐

MANIPAL ACADEMY OF HIGHER EDUCATION
(Deemed University)
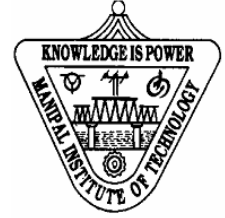
III Sem I & C Engineering, Make up Examination

ELECTRICAL MEASUREMENTS (ICE 205)

(11-01-2007)

Time: 3 Hrs].   **[Max. Marks: 100**

.Note:
- **Answer any FIVE full questions.**
- **All questions carry equal marks.**

1A. Describe the working and construction of an electrodynamometer type instrument. Derive the equation for deflection under AC and DC operation. Why these instruments are called as transfer instruments?

1B. Explain the working principle and derive the torque equation of a moving iron instrument. Describe the construction of a repulsion type instrument.

(12+8 = 20 Marks)

2A. Explain the working of a series type ohm meter with circuit diagram and write a note on the scale.

2B. A meter has an internal resistance of 2000 ohm and requires 50μA for full scale deflection. It is to be converted to a multi voltmeter using the circuit in the figure 1. Rectifiers D1 and D2 each have forward resistance of 400 ohm and are assumed to have infinite resistance in the reverse direction. The ranges of this instrument are a). 0 – 2.5V, b). 0 – 10V, c). 0 – 50V, d). 0 – 100V, e). 0 – 500V, f). 0 –2500V. Calculate the value of R1 to R6.

(12+8 = 20 Marks)

3A. Explain the Murray and Varley loop test for localization of ground and short circuit faults in cables.

3B. Explain the working of a wheat stone bridge and derive the equation for current and voltage sensitivity.

(10+10 = 20 Marks)

4A. Explain the construction and working of a standard potentiometer and discuss about the working current.

4B. Draw the circuit and derive the equation for balance condition of i). Maxwell's inductance capacitance bridge and ii). Hay's bridge.

(10+(6+4) = 20 Marks)

5A. Explain the construction and working of an electrodynamometer type wattmeter. Discuss the shape of the scale and the error caused because of connections.

5B. What is phantom loading? Explain with an example.

(14+6 = 20 Marks)

6A. Explain in detail about the testing of an energy meter.
6B. What is creeping? Explain how it can be rectified.
6C. What are the various forces acting on an instrument. Explain.

(12+4+4 = 20 Marks)