

## 2006 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS  
ELECTRICAL MEASUREMENT  
(ELECTRICAL & ELECTRONIC ENGINEERING)

NOVEMBER 2006

TIME - 3 HOUR  
MARK - 80**Answer any FIVE Questions**  
**All Questions carry equal marks**

1. (a) What is the principle of working of a repulsion type moving iron instrument?  
(b) Explain with the neat sketch the working of such an instrument.  
(c) Discuss the various errors in moving iron instruments and suggest methods to compensate these errors. [4+4+8]
2. (a) In case of an unbalanced load, prove that the sum of readings of two wattmeter's is equal to the power consumed by 3 phase star connected load. [8]  
(b) The readings of two wattmeters employed to measure power in a 3-phase, 3-wire balanced load system are :  $w_1 = 2000\text{w}$  and  $w_2 = 4000\text{w}$ . Find the power factor of the system. [8]
3. (a) Describe with a diagram the construction and working of a ROTATING COIL TYPE SINGLE PHASE power factor meter ?  
(b) What is the need for the use of a Synchroscope in power station.? Explain with a diagram the construction and working of a Moving iron type synchroscope ? [8+8]
4. (a) With a neat sketch explain the measurement of resistance using a potentiometer.  
(b) A potentiometer that is accurate to  $\pm 0.0001$  volts (standard deviation) is used to measure current through a standard resistance of  $0.1 \pm 0.1 \text{ ohm}$  (standard deviation). The voltage across the resistance is measured to be 0.2514 volts. What is the current and to what accuracy it has been determined? [8+8]
5. (a) Explain the operation of any one type of AC potentiometer.  
(b) Explain clearly how such a potentiometer can be employed for measurement of unknown inductance and unknown capacitance. [8+8]
6. (a) What are the different problems associated with measurement of low resistances. Explain.  
(b) How these problems are eliminated by using Kelvins double bridge. Explain [8+8]
7. Describe Heaviside bridge used for measurement of mutual inductance. What is Campbells modification for this bridge. Explain clearly with the help of circuit diagram
8. (a) Describe the construction and working of a moving coil ballistic galvanometer.  
(b) Describe the method of experimental measurement of flux density in a specimen of magnetic material using ballistic galvanometer.