

# ELECTRICAL MEASUREMENTS (For EE Only)

Written by Administrator  
Friday, 06 November 2009 06:07 -

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**Sub Code**

:

**06EE35**

**IA Marks**

:

**25**

**Hrs/ Week**

:

**04**

:

**Exam Hours**

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:

03

**Total Hrs.**

:

52

:

**Exam Marks**

:

100

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## PART – A

### UNIT 1:

**(a) Units and Dimensions:** Review of fundamental and derived units. S.I. units. Dimensional equations, problems. — **3 Hours (8 Marks).**

**(b) Measurement of Resistance, Inductance, and Capacitance:** Wheatstone's bridge — sensitivity analysis, limitations. Kelvin's double bridge. **(4 Hrs -12 Marks).**

### UNIT 2:

**(a)** Earth resistance measurement using Megger. Measurement of earth resistance by fall of potential method. Anderson's bridge. Schering bridge.

Sources and detectors, Shielding of bridges.

Problems

– **6 Hours (20 Marks).**

**UNIT 3:**

**Extension of Instrument Ranges:** Shunts and multipliers. Construction and theory of instrument transformers, Equations for ratio and phase angle errors of C.T. and P.T (derivations excluded). Turns compensation, illustrative examples (excluding problems on turns compensation) — **7 Hours (20 Marks).**

**UNIT 4:**

**Measurement of Power and Related Parameters:** Dynamometer wattmeter. LPF wattmeter. Measurement of real and reactive power in three-phase circuits. Induction type energy meter — construction, theory, errors, adjustments and calibration. Principle of working of electronic energy meter. — **7 Hours (20 Marks).**

**PART – B**

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### UNIT 5:

(a) Construction and operation of electro-dynamometer single-phase power factor meter. West on frequency meter and phase sequence indicator. –  
**3 Hours (10 Marks).**

(b) **Electronic Instruments:** Introduction. True RMS responding voltmeter. Electronic multimeters. Di  
gital voltmeters.

Q meter.  
**3 Hours (10 Marks).**

### UNIT 6:

Dual trace oscilloscope — front panel details of a typical dual trace oscilloscope. Method of measuring amplitude, phase, frequency, period. Use of Lissajous patterns. Working of a digital storage oscilloscope. — **7 Hours (20 Marks).**

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### **UNIT 7:**

**Transducers:** Classification and selection of transducers. Strain gauges. LVDT. Temperature measurements. Photo conductive and photo-voltaic cells.— **6 Hours (20 Marks).**

### **UNIT 8:**

**(a)** Interfacing resistive transducers to electronic circuits. Introduction to data acquisition systems. — **2 Hours (8 Marks)**

**(b) Display Devices and Signal Generators:** X-Y recorders. Nixie tubes. LCD and LED displays. Signal generators and function generators. — **4 Hours (12 Marks).**

### **Text Books**

1. **“Electrical and Electronic Measurements and Instrumentation”**, A. K. Sawhney, Dhanpatrai and Sons, New Delhi.
2. **“Modern Electronic Instrumentation and Measuring Techniques”**, Cooper D. and A.D. Heifrick, P.H.I.

## References

1. **“Electrical Measurements and Measuring Instruments”**, Golding and Widdies, Pitman.
2. **“Electronic Instrumentation and Measurement”**, David A. Bell, 2nd Edition, P.H.I., 2006.
3. **“Electric Measurements”**, Harris, John Wiley.