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**[5459]-154**

**S.E. Electrical (I Semester) EXAMINATION, 2018**

**ELECTRICAL MEASUREMENTS AND INSTRUMENTATION**

**(2015 PATTERN)**

**Time : Three Hours**

**Maximum Marks : 50**

**N.B. :—** (i) Attempt any *four* questions.

(ii) *All* questions carry equal marks.

1. (a) With a suitable diagram explain construction and working of PMMC instrument. [6]
- (b) With suitable circuit diagram explain ammeter and voltmeter method for measurement of resistance. State *two* disadvantages of this method. [6]

*Or*

2. (a) With usual notations derive the equation of final steady state deflection ( $\theta$ ) for PMMC instrument. [6]
- (b) With suitable diagram explain fall of potential method for earth resistance measurement. [6]

P.T.O.

3. (a) A balanced star-connected load is supplied from 3-phase, 440 volt, 50 Hz supply system. The current in each phase 20 Ampere and lags behind phase voltage by  $40^\circ$ . Calculate :
- (i) Phase voltage
  - (ii) Load impedance
  - (iii) Load parameters
  - (iv) Readings of two watt meters connected in the load circuit to measure the power [7]
- (b) With suitable block diagram explain working of electronic energymeter. [6]

Or

4. (a) Explain any *three* errors in induction type energymeter in detail. Also state the method of compensation for these errors. [6]
- (b) With suitable circuit diagram and phasor diagram explain one wattmeter method for measurement of reactive power in a 3-phase star connected (R + L) load. [7]
5. (a) With suitable diagram explain any *two* types of inductive transducer. [7]
- (b) With suitable diagrams explain measurement of phase angle of Lissajous patterns in case of CRO. [6]

Or

6. (a) State the classification of pressure with respective ranges. Also state *two* methods for measurement of pressure in each category. [7]
- (b) With suitable diagram explain construction of CRO. [6]
7. (a) With suitable diagram explain working of LVDT. [6]
- (b) Explain pneumatic method of level measurement with suitable diagram. [6]

Or

8. (a) State any *four* advantages and any *two* disadvantages of semiconductor strain gauges. [6]
- (b) With suitable diagram explain nucleonic method of level measurement. [6]