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**[4757]-1035**

**S.E. (Electrical) (First Semester) EXAMINATION, 2015**  
**ELECTRICAL MEASUREMENT AND INSTRUMENTATION**  
**(2012 PATTERN)**

**Time : Two Hours****Maximum Marks : 50****N.B. :—** (i) Neat diagrams must be drawn wherever necessary.

(ii) Figures to the right indicate full marks.

(iii) Assume suitable data if necessary.

(iv) *All* questions are compulsory.

1. (a) Explain the following terms : [6]

(i) Accuracy

(ii) Repeatability

(iii) Reproducibility.

(b) Draw circuit diagram of Maxwell's Inductance capacitance bridge. Derive expression for unknown inductance with usual notations. [6]

*Or*

2. (a) Explain advantages and disadvantages of PMMC instrument. [6]

(b) Derive general equation for bridge at balance condition. [6]

P.T.O.

3. (a) Explain construction and working of Dynamometer type wattmeter. [6]
- (b) A 230 V, 1  $\phi$  Energy meter has a constant of 4A passing through it for 6 hours at unity power factor. If the meter disc makes 2208 revolutions during this period what is the meter constant in revolution per kWh. Calculate the power factor of the load if the number of revolution's made by the meter are 1472 when operating at 230 V, 5A for 4 hours. [6]

*Or*

4. (a) A wattmeter has current coil of 0.1  $\Omega$  resistance and pressure coil of 6500  $\Omega$  resistance. Calculate the percentage error due to resistance only with each of the two method of connection. When reading the input to an apparatus which takes :
- (i) 12 A at 250 V with unity power factor and
- (ii) 12 A at 250 V with 0.4 power factor. [6]
- (b) Explain electronic energy meter with neat block diagram. [6]
5. (a) Describe how the following measurements can be made with the use of CRO : [6]
- (i) Voltage measurement
- (ii) Current measurement
- (iii) Time period.
- (b) Describe capacitive pressure transducer with neat diagram. [7]

Or

6. (a) Waveform shown in figure is observed on a CRT screen. If the time/div switch is set to  $10 \mu\text{s}$  and volt/div switch is set to  $200 \text{ mV}$ . Determine the frequency and peak to peak amplitude of the signal. [6]

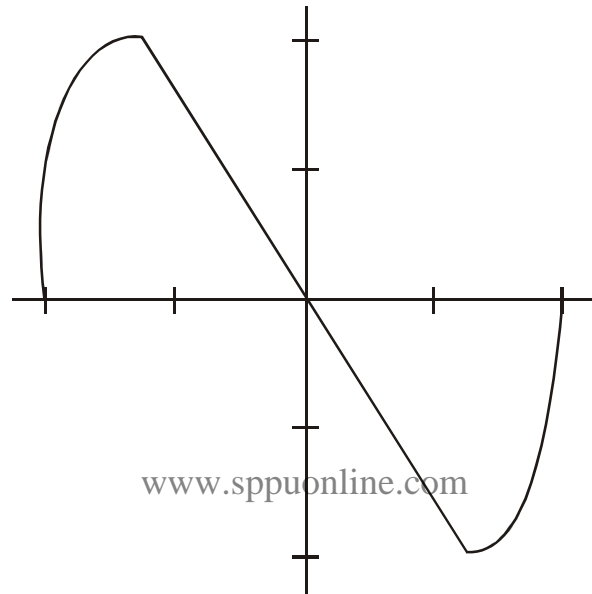


Fig.

- (b) Explain basic requirements of transducer. [7]
7. (a) State types of strain gauges. Explain semiconductor strain gauge. [6]
- (b) Explain inductive method of level measurement. [7]

Or

8. (a) Explain Ultrasonic method of level measurement. [6]
- (b) Explain construction and working of LVDT with neat diagram. [7]