

Registration No. :

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Total number of printed pages – 2

B. Tech
PCEE 4204

Special Examination – 2012

ELECTRICAL AND ELECTRONICS MEASUREMENT

Full Marks – 70

Time : 3 Hours

*Answer Question No. 1 which is compulsory and any **five** from the rest.*

The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10
- (a) Define “Accuracy”.
 - (b) Distinguish between systematic error and random error.
 - (c) Draw a Wheatstone bridge circuit and write the conditions at which the bridge is balanced.
 - (d) Suggest an instrument for measurement of insulation resistance.
 - (e) Why Electrodynamometer type instruments are called Universal instrument ?
 - (f) Write the electrical parameter that can be measured using Ballistic Galvanometer.
 - (g) Draw a circuit diagram showing one wattmeter connected to one resistive load.
 - (h) Why Current Transformer and Potential Transformer are used in Electrical Measurement system ?
 - (i) Write few advantages of Electronic Voltmeters.
 - (j) What is “Harmonic Distortion” ?
2. (a) Draw circuit diagram of Kelvin’s double bridge circuit and derive the conditions for which the bridge is balanced. 5

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- (b) With suitable diagram describe measurement of resistance of earth connection. 5
3. (a) Draw circuit diagram of Maxwell's bridge circuit and derive the conditions for which the bridge is balanced. 5
- (b) Draw circuit diagram of Schering bridge circuit and derive the conditions for which the bridge is balanced. 5
4. (a) Briefly describe construction and principle of operation of d'Arsonval type Galvanometer. 5
- (b) Derive expressions for deflecting torque and angle of deflection of a Permanent Magnet Moving Coil instrument. 5
5. (a) Briefly describe construction and principle of operation of DC potentiometer. 5
- (b) Briefly describe construction and principle of measurement of any one Frequency meter. 5
6. a) Draw circuit diagram and explain operation of Electronics Voltmeters using rectifiers. 5
- (b) Draw block diagram of Digital Voltmeter and explain its' operation. 5
7. (a) Draw block diagram of an Oscilloscope and explain its' operation. 5
- (b) Describe methods of measurement of Frequency and Phase angle using Oscilloscope. 5
8. Write short notes on any **two** : 5 × 2
- (a) Standards of Measurement
- (b) Wagner Earthing Device
- (c) Derivation of deflecting torque of a Moving Iron instrument
- (d) Spectrum Analyzer