Code: R7221303

R07

B.Tech II Year II Semester (R07) Supplementary Examinations, April/May 2013

ELECTRICAL & ELECTRONICS MEASUREMENTS

(Electronics & Control Engineering)

Time: 3 hours Max. Marks: 80

Answer any FIVE questions

All questions carry equal marks

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1 (a) Explain the types of construction used to extend the scale span of PMMC instrument to say about 240^0 to 300^0. Draw neat diagrams to illustrate your answers.

(b) Describe how a potential divider arrangement is used for multiplies in the case of multi-range voltmeters. Derive expressions for resistance for different sections for 4-range voltmeter.

2 (a) Describe the circuit diagram of a series type ohmmeter. Explain how it is designed. What is the significance of half scale value?

(b) Describe the constructional details and working of an electrodynamometer instrument. Derive the equation for deflection under a.c operation if the meter is spring controlled.

3 (a) Explain how power can be measured in a 3 phase circuit with the help of two watt meters. Illustrate your answer with the help of a phasor diagram for a balanced star connected load.

(b) Define the following terms as used for instrument transformers:

(i) Transformation ratio
(ii) Nominal ratio
(iii) Turns ratio
(iv) Ratio correction factor
(v) Burden

Use specific examples to illustrate your answer.

4 (a) Describe the circuit diagram and operation of a triac rms reading voltmeter using thermocouples. Explain how these waveforms are free from waveform errors.

(b) Explain the circuit diagram of following types of electronic voltmeter:

(i) Voltmeters using series connected diode
(ii) Voltmeters using full wave bridge rectifier

5 (a) Derive the expression for vertical deflection of electron beam in CRT.

(b) Describe the principle of working and circuit diagram of a digital oscilloscope.

6 (a) Describe the circuit and working of a Q meter. Derive the equations.

(b) Describe the methods of measurement voltage of radio frequencies.

7 (a) Describe the circuit diagram and working of a laboratory type square wave generator.

(b) With a neat block diagram explain the operation of a spectrum analyzer.

8 (a) Describe with the help of a circuit diagram the working of a universal time counter.

(b) Describe with the help of a suitable circuit diagram, time interval measurements.

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