Printed Pages: 4 | 426/428/450 | NEE302/EEE302/EE304

(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID : 121322 / 121302 / 121314 Roll No. | | | | | | | | | | |

B. Tech.

(SEM. III) THEORY EXAMINATION, 2015-16

ELECTRICAL MEASURMENT & MEASURING INSTRUMENTS

[Time:3 hours] [Total Marks:100]

Section A

1. Attempt **all** questions from the following : (10x2=20)

   (a) Differentiate between accuracy and precision.

   (b) What limitations were overcome by modified De-Sauty's Bridge ?

   (c) Give the range for measurment of low, medium and high resistance.

   (d) What is the need of standardization of AC potentiometers ?

   (e) Three resistors have the following ratings : R_1=200Ω ± 5%, R_2=100Ω ± 5%, R_3=50Ω ± 5%. Determine the magnitude of resultant resistance and limiting errors in % and in ohms if the resistances are connected in series.

(f) Compare digital instruments with analog instruments.

(g) Define burden of instrument transformers.

(h) Discuss the advantage of Lloyd Fisher square over Epstein square.

(i) Why the secondary of current transformer should never be open while the primary winding is energized ?

(j) What Lissajous pattern will appear on screen when two eqaul voltages of equal frequency but with 90% phase displacement are applied to a CRO ?

Section B

Attempt **any five** questions from the section: (5x10=50)

2. (a) Explain the construction and working of electrodynamometer type wattmeter.

   (b) What are the different sources of errors in electrodynamometer type wattmeter ? How these errors can be corrected ?

3. (a) Discuss different detectors used in a.c. bridges. Enumerate different methods for the measurment of inductance.

   (b) Derive balance equation of Anderson's Bridge along with its phasor diagram. Mention advantages and disadvantages of this bridge.

4. (a) Explain the concept behind digital measurments.

   (b) Describe the working of ramp type DVM with suitable diagram.

5. (a) Describe the constructilion and working of flux-meter.

   (b) Prove that the flux is proportional to the deflection of flux-meter.

6. (a) Describe various errors in energy meter. How are they eliminated ?

   (b) Explain why splitting is not necessary in this case while in single phase power factor meter phase splitting has to be done necessary by using R in one circuit and L in other circuit of moving coils.

7. (a) Describe how high currents and voltages are measured with the help of instrument transformers. Draw diagram to illustrate your answer.

   (b) Derive the expression for ratio and phase error in case of current transformer.

8. Describe the construction and working of Weston type frequency meter for the measurment of frequency.

9. (a) Explain the working of Cathode Ray Oscilloscope (CRO).

   (b) Discuss the differences between dual scope and dual beam CRO.

Section C

Attempt **any two** questions from this section.(15x2=30)

10. (a) Distinguish between the null type and deflecting type of instruments. Cite examples to supprt your answer.

    (b) Discuss the role of null type instrument in the measurment of low range resistances.

    (c) Derive the condition for balance with suitable circuit diagram of Kelvin's Double bridge.

11. (a) Describe the construction and working of a polar type potentiometer.

    (b) What are the functions of transfer instrument and the phase shifting transformer ?

    (c) Explain how iron losses can be measured in a specimen through wattmeter method.

12. (a) Describe with phasor diagram, how capacitance can be measured by Schering bridge.

    (b) What is the concept behind digital measurment ? Draw the block diagram of Digital multimeter.

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