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06EE35

Third Semester B.E. Degree Examination, June-July 2009
Electrical Measurements

Time: 3 hrs. Max. Marks:100

Note : ***1. Answer any FIVE full questions, selecting atleast TWO questions from each part.***
2. Assume missing data if any.

PART - A

1 a. Find the relationship between electrostatic units and electromagnetic units. **(04 Marks)**

b. The energy stored in parallel plate capacitor per unit volume (energy density) is given by $W = K \in^a V^b d^c$ where $\in$ is permitivity of medium, d = distance between plates, V = voltage between plates, K = constant of proportionality. Find values of a, b and c using LMTI system. **(08 Marks)**

c. Derive the equation for finding low resistance by Kelvin's Bridge. **(08 Marks)**

2 a. With the help of neat diagram, explain the construction and operation of Megger. **(10 Marks)**

b. Explain sources and detectors used in A.C. bridges. **(04 Marks)**

c. The bridge is shown in fig.2(c) Find the constants of Zx by considering it as series circuit. **(06 Marks)**

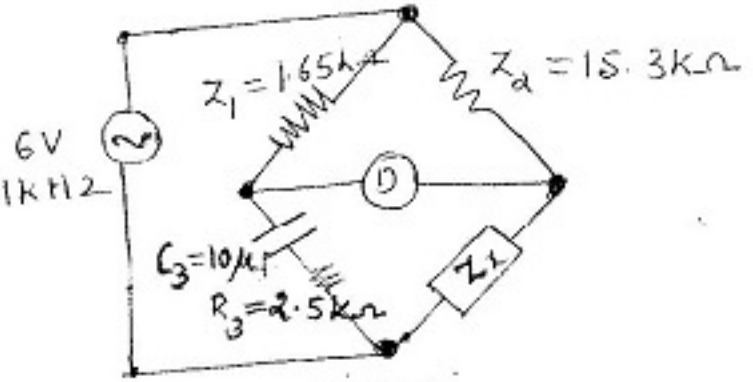

Fig.Q2(c)

3 a. Explain clearly how shunts and multipliers are used to extend the range of instruments. **(04 Marks)**

b. A 1000/5A, 50Hz current transformer has bar primary and a rated secondary burden of 15VA. The secondary winding has 195 turns and a leakage reactance of 0.96 mH. The load burden is purely resistance. At rated load, the magnetizing m.m.f is 20A and core loss excitation is 12A. Find the ratio and phase angle errors. **(10 Marks)**

c. What are the advantages of Instrument Transformer? Define Transformation ratio, Nominal ratio of Instrument Transformers. **(06 Marks)**

4 a. Explain with the help of neat sketch, construction of Induction type Energy meter. **(07 Marks)**

b. Explain the working of Low power factor wattmeter. (05 Marks)
c. Write in brief on i) Measurement of reactive power in 3 phase systems
ii) Electronic energy meters. (08 Marks)

PART - B

5 a. Explain the construction and operation of Weston frequency meter. (10 Marks)
b. Write a note on phase sequence indicator. (04 Marks)
c. Explain the operation of successive approximation type of digital voltmeter. (06 Marks)

6 a. Explain with the help of block diagram dual trace oscilloscope. (08 Marks)
b. Explain the measurement of frequency using Lissajous patterns. (06 Marks)
c. Explain the working of digital storage oscilloscope. (06 Marks)

7 a. Explain the classification of transducers with the help of examples. (08 Marks)
b. Prove that gauge factor of strain gauge is given by $K = 1 + 2\mu$, where μ is the Poisson's ratio. (06 Marks)
c. Explain Photo conductive and Photo voltaic cells. (06 Marks)

8 a. Explain briefly Data acquisition system. (05 Marks)
b. Explain the classification of displays. (03 Marks)
c. Explain with the help of diagram, the operation of X – Y recorders. (06 Marks)
d. Explain the working of function generator with the help of neat diagram. (06 Marks)

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