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SF-8342

B. E. III (Sem. VI) (Electrical) Examination

May / June – 2011

Electrical & Electronic Measurement

(New Course)

Time : Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. 3 (Sem. 6) (Electrical)**

Name of the Subject :

☛ **Electrical & Electronic Measurement (New)**

☛ Subject Code No. : **8 3 4 2** ☛ Section No. (1, 2,.....) : **NIL**

Seat No. :

Student's Signature

(2) Attempt all questions.
(3) Figure to the right indicate full marks.
(4) Assume suitable data if necessary.

1 (a) Answer the following questions :

(i) List methods to measure high resistance. **2**

(ii) Wein bridge is used to measure frequency. (State 'true' or 'false') **1**

(iii) Megger is used to measure insulation resistance (State 'true' or 'false') **1**

(iv) List various types of errors. **2**

(v) Explain in brief the term : Precision. **2**

(vi) Explain in brief the term : Accuracy. **2**

(b) Derive general equation for bridge balance in case of ac bridges. Explain how it is different from dc bridge. **10**

2 (a) Discuss Maxwell's inductance - capacitance bridge to measure self inductance. List its advantages and disadvantages. **10**

(b) Discuss substitution method to measure medium resistance. **5**

OR

2 (a) List methods to measure capacitance and explain schering's bridge. **10**

(b) A sheet of Bakelite 4.5 mm thick is tested at 50 Hz between electrodes 0.12 m in diameter. The Schering bridge employs a standard capacitor C_2 = 106 pF capacitance, a non-reactive resistance $R_4 = 1000/\pi\Omega$ in parallel with a variable capacitor C_4, and a non reactive variable resistance R_3. Balance is obtained with $C_4 = 0.5\ \mu F$ and R2 $=260\,\Omega$. Calculate the capacitance, power factor and relative permittivity of sheet. **5**

3 Attempt any "three" : **15**

(i) Discuss Wheatstone bridge method to measure resistance

(ii) Explain measurement of resistance of earthing electrode

(iii) Explain : ammeter voltmeter method to measure medium resistance.

(iv) Discuss direct deflection method to measure high resistance.

4 (a) Answer the following questions (2 marks each) **10**

(i) List factors affecting CT error.

(ii) Define : Magnetizing force

(iii) List types of fault in Cable.

(iv) Why CT secondary must not be kept open ?

(v) Define : Nominal ratio, Transformation ratio in connection with instrument transformers.

(b) Discuss fall of potential method to determine fault location in cables. **10**

5 (a) Discuss Murray's Loop test to localize cable faults. 8

(b) Write a short note on : Flux meter. 8

OR

5 (a) With neat sketch explain equivalent circuit of PT, phasor diagram of PT and derive expression for ratio error. 8

(b) A CT has single turn primary and 400 secondary turns. The magnetizing current is 90 A while core loss current is 40 A. Secondary circuit phase angle is 28°. Calculate the actual primary current and ratio error when the secondary carries 5A current. 8

6 Attempt any "two" : **14**

(i) Discuss tests to find out open circuit faults in cables.

(ii) Discuss method to determine B-H curve of a magnetic material

(iii) Write a short note on : Differences between CT and PT.

(iv) Explain factors affecting errors of CT.