USN ☐☐☐☐☐☐☐☐☐☐ 18EE36

Third Semester B.E. Degree Examination, Jan./Feb. 2023
Electrical and Electronics Measurements

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain measurement of medium resistance by wheat stone bridge method. **(06 Marks)**
   b. Explain measurement of low resistance by Kelvin's double bridge method. **(08 Marks)**
   c. Explain measurement of earth resistance by fall of potential method. **(06 Marks)**

OR

2 a. With the help of neat circuit diagram, explain the measurement of inductance by Maxwell's inductance and capacitance bridge. **(12 Marks)**
   b. A Maxwell's inductance comparison bridge is shown in Fig.Q.2(b). Arm ab consists of a coil with inductance L_1 and resistance r_1 in series with a non inductive resistance R. Arm bc and coil ad are each a non inductive resistance of 100Ω. Arm ad consists of standard variable inductor L of resistance 32.7Ω. Balance is obtained when $L_2 = 47.8mH$ and R = 1.36Ω. Find the resistance and inductance of coil in arm ab. **(08 Marks)**

Fig.Q.2(b)
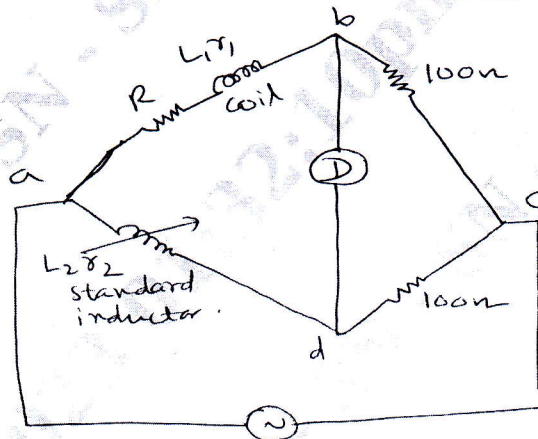
Module-2

3 a. With the help of neat circuit, explain construction and working of single phase energy meter. **(10 Marks)**
   b. With the help of neat sketch, explain construction and operation of single phase dynamometer type power factor meter. **(10 Marks)**

OR

4 a. Explain construction and operating principle of Weston frequency meter. **(10 Marks)**
   b. With the help of neat sketch, explain construction and working principle of phase sequence indicator. **(10 Marks)**

Module-3

5 a. Draw the equivalent circuit and phasor diagram of a current transformer. Derive the expressions for ratio and phase angle errors. **(12 Marks)**

b. A potential transformer, ratio 1000/100 volt has the following constants
Primary resistance = 94.5Ω
Secondary resistance = 0.86Ω
Primary reactance = 66.2Ω
Total equivalent reactance = 110Ω
No load current = 0.02A at 0.4 power factor.
Calculate: i) Phase angle error at no load   ii) Burden in VA at unity power factor at which the phase angle will be zero. **(08 Marks)**

OR

6 a. Explain Silsbee's method of testing CT. **(10 Marks)**

b. Explain measurement of flux density in ring specimens. **(10 Marks)**

Module-4

7 a. Explain construction and working of true rms reading voltmeter. **(10 Marks)**

b. With the help of neat circuit, explain working of electronic multimeter. **(10 Marks)**

OR

8 a. Explain construction and working principle of 'Q' meter. **(10 Marks)**

b. Explain with the help of block diagram construction and working of electronic energy meter. **(10 Marks)**

Module-5

9 a. With the help of neat sketch, explain the construction and working principle of strip chart recorders. **(10 Marks)**

b. With the help of neat sketch, explain the working of cathode ray tube. **(10 Marks)**

OR

10 a. With the help of neat sketch, explain working of xy recorders. **(10 Marks)**

b. Explain construction and working of ultra violet recorders. **(10 Marks)**

* * * * *