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RM-7109

B. E. - III (EL) (Sem. VI) Examination

May / June – 2010

Electrical Measurement & Instrument - II

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 (EL) (Sem. 6)**

Name of the Subject :

☛ **Electrical Measurement & Instrument - 2**

☛ Subject Code No. : **7 1 0 9** ☛ Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

(2) Attempt all questions.
(3) Assume suitable data if required.
(4) Support your answers with neat sketches.
(5) Figures to the **right** indicate maximum marks.
(6) Answer of both the section must be written in separate answer book.
(7) Be brief in description.

SECTION - I

1 (a) Do as directed :

(i) Match the following : **2**

Method	Type of Fault
(a) Loop test	(i) Open circuit fault
(b) Blavier test	(ii) Ground and short circuit fault
(c) Pulse Echo Method	(iii) Ground fault
(d) Bridge Method	(iv) Ground, short circuit and open circuit fault

(ii) Explain the function of calibration resistance in EVM. **1**

(iii) Draw block diagram of a.c. EVM. **2**

(iv) What do you understand by drift. List types of drift. **2**

(v) Draw the Lissajous pattern with two equal voltages of same frequency and phase shift of (i) $\phi = 0^o$ and (ii) $\phi = 90^o$. **2**

(vi) What is the function of the signal manipulating element in a generalized measurement system? **1**

(b) (i) Explain Murray-loop test for locating short circuit fault. **5**

(ii) Describe method of correction for interfering and modifying inputs in brief. **5**

2 (a) Explain emitter follower type of electronic voltmeter. **7**

OR

(a) Draw the block diagram of CRO and also explain the function of each block. **7**

(b) (i) Explain peak reading Ac voltmeter. **4**

(ii) A short circuit fault is located by Varley loop test as shown in figure 1. The ratio arms are set at P = 6 Ω and Q = 12 Ω and the values of variable resistance S are 16 Ω for position 2 of switch K and 7 Ω for position 1. The sound and faulty cables are identical and have a resistance of 0.4 Ω/km. Determine the length of each cable and the distance of fault from test end. **4**

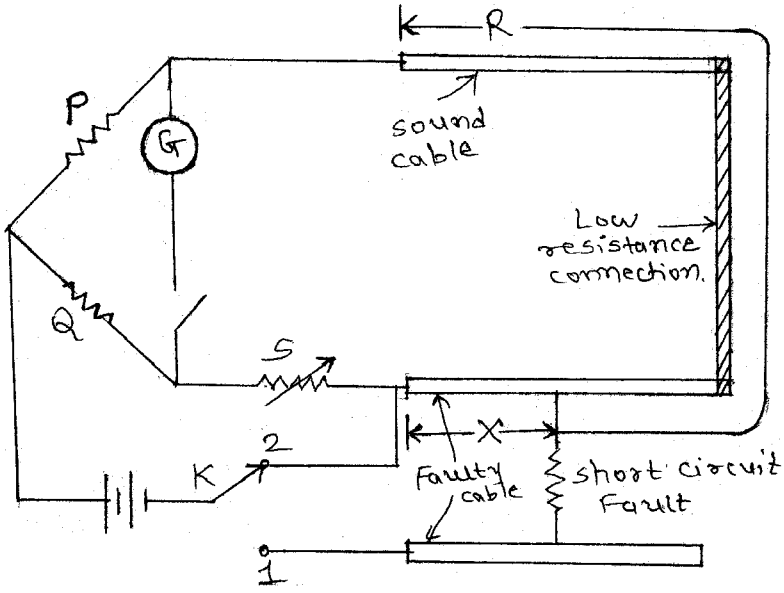

Fig. 1

3 Attempt any three : **15**

(i) Discuss various applications of oscilloscope for the measurement of voltage, phase angle and frequency.

(ii) Explain difference amplifier type of electronic voltmeter.

(iii) Two quantities x_1 and x_2 have limiting errors of $\pm\delta x_1$ and $\pm\delta x_2$ respectively. Derive expression for relative limiting error in X, when $X = x_1 - x_2$.

(iv) Explain systematic error in brief.

(v) What are the corrections to be carried out in loop tests when cables (faulty and sound) are having different resistance per unit length. Also derive the formula for the same.

SECTION - II

4 (a) Answer the following questions : **10**

(i) Distinguish between active and passive transducer.

(ii) What is strain gauge?

(iii) What are the strip chart recorders?

(iv) What is telemetry?

(v) State application of x-y recorders.

(b) Define following terms : **5**

(i) Impulse voltage

(ii) Impulse flashover voltage

(iii) Impulse puncture voltage

(iv) Disruptive discharge voltage

(v) Impulse ratio for flashover

(c) Give classification of transducers. **5**

5 (a) Explain construction and working principle of Linear variable differential transducer. Also describe performance characteristic of LVDT. **8**

(b) Explain any three types of strain gauge. **7**

OR

5 (a) Describe working principle of thermocouple. Also explain laws of thermocouple. **10**

(b) Explain different marking mechanism used in recorders. **5**

6 Attempt any **three** : **15**

(a) X-Y Recorders

(b) Cock Croft Walton circuit for generation of high voltage DC.

(c) NRZ-M method of digital tape recording.

(d) Explain Construction and working principle of oil testing set

(e) Explain basic block diagram of telemetry system.
