## Sixth Semester B.E. Degree Examination, June/July 08
## Electronic Instrumentation

Time: 3 hrs.                                       Max. Marks:100

**Note : 1. Answer any FIVE full questions.**
              **2. Draw neat sketches/circuit diagrams wherever necessary.**

1   a. How do accuracy and precision differ from each other? Explain with examples. **(06 Marks)**
     b. Give the theory and working of LEDs highlighting its advantages. **(08 Marks)**
     c. Three resistors have the following ratings $R_1 = 37\Omega \pm 5\%$ ;       $R_2 = 75\Omega \pm 5\%$ ; $R_3 = 50\Omega \pm 5\%$. Determine the magnitude and limiting error in ohm and in percent if the above resistances are connected in series. **(06 Marks)**

2   a. Explain with a neat circuit schematic the true RMS responding voltmeter. **(07 Marks)**
     b. With the aid of a block diagram give the procedure of measuring AC voltage by a differential voltmeter. **(07 Marks)**
     c. A sawtooth voltage as shown in Fig,2(c) has a peak value of 50V and a time period of 3.0 sec. Calculate the error when measuring this voltage with an average reading voltmeter calibrated in terms of RMS value of a sinusoidal wave. **(06 Marks)**
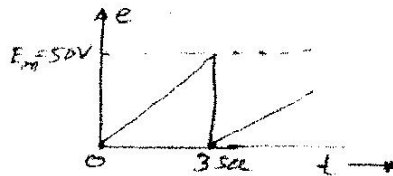


Fig.2(c)

3   a. With a neat block diagram explain how phase angle and magnitude are measured using vector impedance meter. **(10 Marks)**
     b. Draw a basic block diagram and explain microprocessor based RAMP type DVM. Also sketch the voltage waveform. **(10 Marks)**

4   a. Explain the basic technique of measuring the phase difference between two signals with the aid of block diagram. **(07 Marks)**
     b. Using block diagram describe how different waveforms can be generated. **(08 Marks)**
     c. What do you mean by standard signal generator? Explain. **(05 Marks)**

5   a. Explain the principle of operation of stroboscope and the procedure for measuring speed of a motor. **(08 Marks)**
     b. Give the working principle of a Q-meter. Also outline the factors that cause errors during Q-measurement. **(07 Marks)**
     c. Compute the value of self capacitance for the following data :
        First measurement $f_1 = 2\,MHz$      and   $C_1 = 500\,pF$
        Second measurement $f_2 = 3f_1$      and    $C_2 = 50\,pF$ **(05 Marks)**

6   a. Using block diagram explain the functioning of a typical X-Y recorder. **(08 Marks)**
     b. Describe the direct measurement of leakage current in a transistor. **(05 Marks)**
     c. With the help of a basic schematic circuit explain R-X meters. **(07 Marks)**

7   a. Describe with a neat sketch the transducer which makes use of the variation in capacitance. **(08 Marks)**
     b. List the advantages and disadvantages of LVDT. **(08 Marks)**
     c. A resistance strain gauge with a gauge factor of 2 is connected to a steel member, which is subjected to a strain of $1 \times 10^{-6}$. If the original resistance value of the gauge is 130 $\Omega$, calculate the change in resistance. **(04 Marks)**

8   Write explanatory notes on :
     a. Rectifier voltmeter                    b. Digital frequency meter
     c. Field strength meter                  d. Inductive transducer. **(20 Marks)**