Printed Pages—4                                   TEC—303

(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 3075**   Roll No.

# B.Tech.

## THIRD SEMESTER EXAMINATION, 2006 - 07

## ELECTRONICS MEASUREMENTS AND INSTRUMENTATION

*Time : 3 Hours*                          *Total Marks : 100*

**Note :**  (i)   *Attempt **ALL** questions.*

(ii)  *All questions carry equal marks.*

(iii) *In case of numerical problems assume data wherever not provided.*

(iv)  *Be precise in your answer.*

1.  Attempt *any two* parts of the following :        (10x2=20)

(a)  (i)   Explain the Dynamic-characteristics of instruments.

(ii)  A 600 V voltmeter is specified to be accurate within $\pm 2.5\%$ at FSD. Calculate the limiting error when the instrument is used to measure a voltage of 400 V.

(b)  Why and how thermocouples are connected in series and parallel ? Write down the advantages and disadvantages of thermocouples.

(c) Draw a circuit of true RMS meter and explain its working.

2. Attempt *any two* parts of the following :        (10x2=20)

   (a) Which property of the thermistor makes it suitable to act as a transducer ?

   (b) An AC LVDT has the following data :

   Input = 6.3 V          Output = ±0.5 in

   Find the output voltage Vs core-position for a core movement going from +0.5 inch to −0.3 inch. Also calculate the output voltage when the core is −0.25 inch from the centre.

   (c) Prove that schering bridge can be used to measure the insulating properties and values of capacitance with high precision.

3. Attempt *any two* parts of the following :        (10x2=20)

   (a) (i) Define 'Resolution' and sensitivity of Digital Meters.

   (ii) A $4\frac{1}{2}$ Digit Voltmeter is used to measure voltage. Find :

   1. Resolution

   2. How would 16.58 would be displayed on a 10V range ?

   3. How would 0.7254 be displayed on 1V and 10 V range ?

(b) Draw the block diagram and its working of an integrating type DVM.

An integrator has a 100 k$\Omega$ and 1 $\mu$F capacitor. If the voltage applied to integrator input is 1V, find the voltage developed at the output after 1 sec. If the reference voltage is applied to the integrator at time $t_1$, is 5V, find time interval of $t_2$.

$t_1 \rightarrow$ Rise-time of reference voltage waveform at output of integrator.

$t_2 \rightarrow$ Fall-time of reference voltage waveform.

(c) Explain the theory of LCD displays. Compare LCD displays with LED displays.

4. Attempt *any two* parts of the following :      (10x2=20)

(a) Differentiate between double beam CRO and Dual-Trace CRO in detail.

(b) State the function and explain the working of a 10 : 1 probe for a CRO.

(c) The waveform shown below is observed on the screen of an oscilloscope.
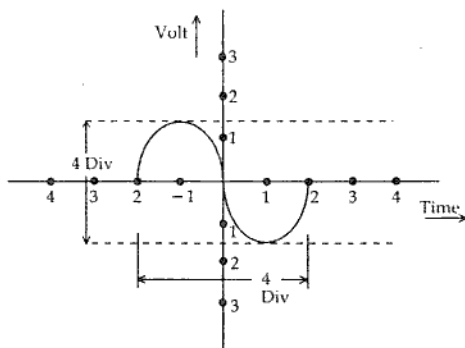


If the vertical attenuation is set to 0.5 V/Div, determine the peak to peak amplitude of the signal. If the time/Div control is set to 2$\mu$s/Div, determine the frequency of the signal.

5.    Attempt *any two* parts of the following :        (10x2=20)

    (a)    Explain the working of a Pulse Generator.  What are specific requirements of pulse output ?

    (b)    How are broadband sweep frequencies generated in a sweep generator ?

    (c)    Explain working and application of marker generators.

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