(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 ±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 kΩ and 1 μF 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.

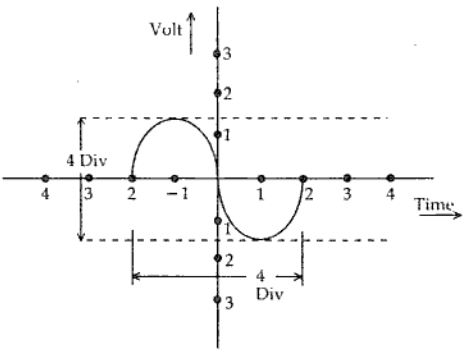
(c) Explain the theory of LCD displays. Compare LCD displays with LED displays.

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 2μs/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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