Paper Code: EIC-703	Roll No.									

B.Tech.
(SEM VII) ODD SEMESTER EXAMINATION2015-16
DIGITAL MEASUREMENT TECHNIQUES

[Time: 3 hrs.] **[Max. Marks: 100]**

Note- ***Attempt All Questions. All Questions carry equal marks*:-**

1. Attempt any four of the following:

a) Sketch and explain the waveform for a circuitry that is used for measurement of time interval between two eventsdefined by V_H and V_L voltage levels.
b) Explain the various techniques to measure small time interval between two events.
c) Explain in brief the philosophy of digital and microprocessor/microcontroller based instruments.
d) Explain Phase measurementtechniques without frequency error.
e) Explain why the conventional method of frequencymeasurement in not suitable for very frequency measurement.
f) Realize a circuit & sketch voltage transfer characteristic of measuring time interval between two events represented by two voltage levels.

2. Attempt any four of the following:

a) Explain the method for high frequency measurement.
b) Draw the circuit to display the peak frequency of input signal and explain it.
c) Draw the block diagram of digital frequency meter. Explain its principle of operation.
d) The clock frequency of a digital counter is lMHz. Find the value ofthe unknown frequency *f*which is measured with the same precision in the period mode as well in the frequency mode with a gating time of 2 seconds.
e) Discuss a scheme for Low Frequency Measurement.
f) With suitable circuit diagram show how you can measure ratio of two frequencies

3. Attempt any two of the following:

a) Describe the methods for measurement of capacitance at high frequency.
b) Explain in detail the Digital programmable Gain Amplifier. Design a programmable gain amplifier for the gains 0,-1,-2,-3,-7, choosing R_T=24Ω.
c) Explain the working of a digital multimeter and mention its use.

4. Attempt any two of the following:

a) Why Sample and hold circuit is considered as anessentialcomponent of modern day's instrumentationsystem? Explain the following terms that are associated with the problems of sample-hold circuits: (i) finite aperture time,(ii) signal feed through and (iii) Droop.
b) Describe in detail the successive approximation method of ADC.
c) Explain the input –output relationship of digital to analog converters. Discuss binary weighted charge type DACs. Justify the relation R_K=R2k for weighted resistor DAC.

5. Attempt any two of the following:

a) What is the difference between VTC and VFC ? Explain with the help of proper diagram. Give the detail of any single type of VTC.
b) Differentiate indirectand directtypeADC and explain any one technique of direct type ADC.
c) Designa3 digit l-V DVMbased onthe dual slopeprinciple, for the following specification. Clock frequency 200 Khz, conversion rate 25 samples/s, auto-ranging arrangement for 1, 10, 100, 1000Vranges, independentof 50Hzhum present in the signal, R_{in}=10 MΩ.