

**End Semester Examinations - 2015-16 Even Semester - May 2016**

**14EI2011 Electronic Instrumentation**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

1. (i) Sketch the complete circuit of an emitter – follower voltmeter using a FET stage and explain the circuit operation. (10 Marks)  
(ii). Draw the block diagram for the vector impedance meter and explain in detail. (10 Marks)  

**OR**
2. (i) Sketch the block diagram and system waveforms for a DVM using a Dual Slope type analog to digital converter. Explain its operation. (10 Marks)  
(ii). Draw the basic block diagram of a digital frequency meter, sketch the waveforms and explain the instrument operation. (10 Marks)
3. (i) Explain the basic block diagram of a sampling oscilloscope. Sketch the waveforms throughout the system and explain its operation. (14 Marks)  
(ii) Draw a diagram to show the cross section of liquid crystal cell. Identify each part of the cell and explain its operation. (6 Marks)  

**OR**
4. (i) A  $\pm 40\text{V}$ , 500Hz triangular wave is applied to the vertical deflecting plates of a CRT, and a  $\pm 50\text{V}$ , 250 Hz sawtooth wave is applied to the horizontal deflecting plates. The CRT has a 0.1 cm/V vertical deflection sensitivity and a 0.08cm/V horizontal deflection sensitivity. Assuming that the two inputs are synchronized, construct the waveform displayed on the screen. (14 Marks)  
(ii) Name four types of displacement transducer and describe one application of each type. (6 Marks)
5. (i) Explain the function of a sweep frequency generator with neat diagram. (10 Marks)  
(ii) Discuss in detail about the frequency synthesizer block diagram. (10 Marks)  

**OR**
6. (i) Draw an op-amp Monostable multivibrator circuit. Show the waveforms at various points in the circuit and explain its operation. (14 Marks)  
(ii) Compare the performance of digital and analog multi-meters. (6 Marks)
7. (i) Draw the Wein's bridge oscillator circuit diagram. Explain how the circuit operates, and write equations for output frequency and amplifier gain. (10 Marks)  
(ii) Explain the working principle of harmonic distortion wave analyzer and describe its working in detail. (10 Marks)  

**OR**
8. (i) Sketch the block diagram of a basic function generator and explain briefly. (14 Marks)  
(ii) Sketch a series and shunt type ohmmeter as used with electronic voltmeter. (6 Marks)
9. (i). Explain the concept of virtual Instrumentation. (10 Marks)  
(ii). Explain the stages involved in engineering of products using virtual instrument with a neat schematic diagram. (10 Marks)