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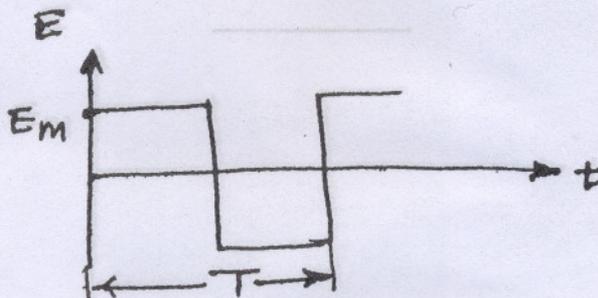
Electronic Instrumentation

N.B.: (1) Question No. 1 is compulsory.

(2) Attempt any four questions from remaining six questions.

2.30 to 5.30

1. Attempt any four questions :— 20
  - (a) Define Transducer. Differentiate between Analog and Digital Transducers.
  - (b) What is the role of time base generator in a CRO ?
  - (c) Why is a wave analyzer called a frequency selective voltmeter ?
  - (d) Explain Digital Multimeter.
  - (e) The lowest range on a  $4\frac{1}{2}$  digit digital voltmeter is 10 mV full scale. What is the resolution of the meter ?
  
2. (a) What is meant by Digital Modulation ? Explain various digital modulation techniques. 10
- (b) A symmetrical square wave voltage of the type shown is applied to an average responding ac voltmeter with a scale calibrated in terms of rms value of a sine wave. Calculate— 6
  - (i) Form factor of square wave voltage.
  - (ii) Error in meter indication.



- (c) Write a note on automation in digital instruments. 4
  
3. (a) Describe how Q meter is used for the measurement of low impedance. What are the various sources of error in Q meter ? 10
- (b) Draw and explain the blockdiagram of Digital Storage Oscilloscope. State its advantages and applications in communications. 10
  
4. (a) Draw and explain the structure of a conventional CRT. 10
- (b) Explain the type of analyzers used for optimizing microwave Network design. 6
- (c) Explain the principle of piezoelectric transducers. 4

5. (a) What is meant by Resistive Transducers. Why are they preferred over those employing other principles ? Explain any two types. 10
- (b) Explain PCM telemetry system. 6
- (c) In an experiment the voltage across a  $10\text{ K}\Omega$  resistor is applied to CRO. The screen shows a sinusoidal signal of total vertical occupying 3 cm and horizontal occupying of 2 cm. The front panel control is on 2 v/div and 2 ms/div respectively. Calculate rms value of voltage across resistor and its frequency. 4
6. (a) What is meant by Total Harmonic Distortion ? Explain fundamental suppression Harmonic Distortion Analyzer. 10
- (b) Explain the operation of a binary weighted resistor technique of Digital to Analog conversion. 6
- (c) A voltmeter having a sensitivity of  $1000\ \Omega/\text{V}$  reads 100 V on its 150 V scale when connected across an unknown resistor in series with a milliammeter. When mA reads 5 mA ? Calculate the error due to loading effect of voltmeter. 4
7. (a) Explain in brief the different sensors used for temperature measurement. 10
- (b) Explain the various performance parameters of ADC. 6
- (c) In a 4 bit DAC for a digital input of 0100 an output current of 10 mA is produced. What will be the output current for digital input of 1011 ? 4