Code No: R5320204 **R5**

III B.Tech II Semester(R05) Supplementary Examinations, May 2010
INSTRUMENTATION
(Electrical & Electronic Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the terms 'accuracy' and 'precision' and discuss the need for having them properly matched to each other.
   (b) Define 'dynamic error' and show how it differs with the type of input signal applied to the system. [8+8]

2. (a) What are sidebands of a modulated signal and explain their presence in AM and FM Signals.
   (b) Define distortion of a periodic signal and how is it estimated? [16]

3. Define deflection sensitivity and deflection factor of a cathode ray tube. [16]

4. (a) Mention the resolution of a DVM with n-digit display.
   (b) What is the resolution of a $3\frac{1}{2}$ digit display on 1v and 50v ranges? [8+8]

5. (a) What is a wave analyzer? Mention its significance in measurement system
   (b) Explain the working of a Frequency selective wave analyzer with a neat block diagram.
   (c) Mention few applications of heterodyne wave analyzers. [4+8+4]

6. A piezoelectric transducer has a capacitance of 1000pF and a charge sensitivity of 40×10^{-3} C/m. The connecting cable has a capacitance of 300pF while the oscilloscope used for readout has an input resistance of 1MΩ and a parallel capacitance of 50pF.
   (a) what is the sensitivity of the transducer alone?
   (b) (V/m) of the entire measuring system?
   (c) what is the lowest frequency that can be measured with a 5% amplitude error by the entire system
   (d) what is the value of external shunt capacitance that can be connected in order to extend the range of 5% error down to 10 Hz?
   (e) What is the high frequency sensitivity, when the external shunt capacitance calculated in
   (f) is connected in the circuit. [16]

7. (a) What are the uses of strain gauges.
   (b) Explain various strain gauge circuits. [4+12]

8. (a) Explain liquid level measurement by variable permeability method.
   (b) Explain liquid level measurement by variable dielectric constant method. [8+8]

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