

III B.Tech(ccc) Regular Examinations, December 2007  
**ELECTRONIC MEASUREMENTS AND INSTRUMENTATION**  
(Electronics & Communication Engineering)

Time: 3 hours

Max Marks:100

Answer any FIVE Questions  
All Questions carry equal marks

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1. (a) Explain what is meant by true R.M.S. responding voltmeter and why is it a must in certain applications. Name them.  
(b) Distinguish between functions of the following
  - i. Electronic analog voltmeter
  - ii. Digital multimeter
  - iii. a.c. milli voltmeter and
  - iv. true RMS voltmeter. [10+10]
2. (a) Derive an expression for the sensitivity of a wheatstone Bridge with equal arms  
(b) What is the usual procedure for balancing the Maxwell bridge? What is the necessity for following such a procedure? Explain with the circuit diagram. [10+10]
3. (a) Define
  - i. Histogram
  - ii. Arithmetic mean
  - iii. Standard Deviation
  - iv. Variance
  - v. Gaussian curve of errors.
  - vi. Mean.(b) The following 10 observations were recorded when measuring a voltage: 41.7, 42.0, 41.8, 42.0, 42.1, 41.9, 42.0, 41.9, 42.5 and 41.8 volt. Find
  - i. the Mean
  - ii. the standard deviation
  - iii. the probable error of one reading and
  - iv. the probable error of mean
  - v. range. [8+12]
4. (a) Draw the neat block diagram of a general purpose oscilloscope and explain its basic operation.  
(b) Explain the following terms:
  - i. Fluorescence
  - ii. Phosphorescence

- iii. Persistence. [9+11]
5. With a neat sketch explain the operation of
- (a) Heterodyne wave Analyzer.
  - (b) Write a short notes on Frequency selective wave analyzer. [10+10]
6. Explain the principle of frequency counter. How is the multiplexed display used in a frequency counter? [20]
7. (a) Where are piezoelectric transducers mainly used and why?
- (b) Give the equivalent circuit of a crystal and explain how a crystal is used as a transducer?
  - (c) Explain the working of a piezoelectric transducer with suitable equations and sketches. [5+5+10]
8. (a) What are the materials used in making strain gauges? [7]
- (b) What are the different types of strain gauges? Explain them briefly [7]
  - (c) What are the applications of strain gauges? [6]

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