

**IV B.Tech I Semester Supplementary Examinations, April/May 2005**  
**ELECTRONIC MEASUREMENTS & INSTRUMENTATION**  
**(Electronics & Communication Engineering)**

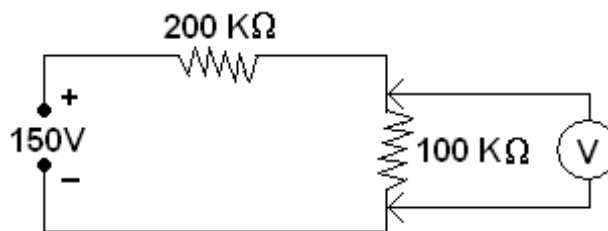
Time: 3 hours

Max Marks: 70

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. (a) What is meant by voltmeter sensitivity? Explain its relevance in circuit applications. What is meant by loading effect? What circuit arrangement is done to avoid the same.
- (b) It is desired to measure the voltage across the  $100\text{K}\Omega$  resistor in the circuit given below. Two voltmeters are available for this measurement. Voltmeter 1 with a sensitivity of  $1000\Omega/\text{V}$  and voltmeter 2 with a sensitivity of  $20,000\Omega/\text{V}$ . Both meters are used on their  $50\text{V}$  range. Calculate
  - i. the reading of each meter
  - ii. error in each reading, expressed as a percentage of the true value.



2. Describe with the help of a circuit diagram, the working of a universal time counter. Explain the various functions it is capable of performing.
3. (a) What are the errors made in the measurement of resistance using Wheatstone bridge? What are the ways of minimizing them?
- (b) An unbalanced Wheatstone bridge is supplied with a  $6\text{ V DC}$  and the resistances are  $2.5\text{ kohm}$ ,  $10\text{ kohm}$ ,  $3.5\text{ kohm}$  and  $1\text{ kohm}$  in the clockwise direction starting from the junction of resistors connected to positive terminal of the DC supply. If the galvanometer has an internal resistance of  $300\text{ ohm}$ , calculate the current through the meter.
4. (a) Discuss the effect of variations in secondary current , PF of secondary burden, and frequency on the performance of a PT.
- (b) A Potential Transformer with ratio  $1000/100\text{ V}$  has the following constants :  
 Primary resistance =  $96\ \Omega$  , Secondary resistance =  $0.86\ \Omega$   
 Primary reactance =  $66\ \Omega$  , Total equivalent reactance =  $110\ \Omega$   
 No load current =  $0.02\text{ A}$  at  $0.4\text{ PF}$ .  
 Calculate

- i. Phase angle error at no load
  - ii. Burden in VA at unity PF at which the phase angle will be zero.
- 5. Describe the following:
  - (a) Sources of Synchronisation.
  - (b) Blanking circuit
  - (c) Focus control
- 6. (a) Draw and discuss the spectral displays of various modulations using Spectrum analyzer.
  - (b) Write about portable oscilloscopes.
- 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 construction and working of strain gauge.
- 8. (a) What is Rosettes? Explain with neat sketches the different forms of it.
  - (b) Explain semiconductor strain gauges.

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