

B.Tech III Year I Semester (R13) Supplementary Examinations June 2017

**ELECTRONIC MEASUREMENTS & INSTRUMENTATION**

(Electronics & Instrumentation Engineering)

Time: 3 hours

Max. Marks: 70

**PART – A**  
(Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
- Write the significance of delay distortion measurement.
  - What is time domain reflectometry?
  - Compare DC amplifier and the differential amplifier.
  - Why are FETs used in differential amplifier type electronic voltmeter?
  - Distinguish between DC probes and AC probes.
  - Why the accuracy obtainable with the potentiometer method of measuring low resistance is high?
  - Draw the block diagram of a typical LCR meter.
  - Enlist the assumptions made in resonance methods of component measurement.
  - What are the parameters to be measured in transmitting systems?
  - What is a T-Network? What are the different types of T-Networks?

**PART – B**  
(Answer all five units, 5 X 10 = 50 Marks)

**UNIT – I**

- 2 Describe working of the network analyzer with necessary diagrams.

**OR**

- 3 (a) A first order Instrument, with a time constant of 1 sec is subjected to the following inputs. Find the response in each case: (i)  $tu(t)$  Ramp inputs. (ii)  $t^2u(t)$  Parabolic inputs. (iii) Unit impulse function  
(b) List the precautions that are to be taken while making Sine-wave testing.

**UNIT – II**

- 4 (a) Explain the circuit diagram and operation of a photo conductive chopper amplifier.  
(b) List the applications of chopper stabilized amplifiers.

**OR**

- 5 (a) Describe with the help of a differential amplifier circuit diagram using two FETs and derive the expression for the output voltage.  
(b) What are the disadvantages of a DC amplifier?

**UNIT – III**

- 6 (a) Explain the functioning of a Ramp type digital voltmeter.  
(b) Sketch a range-changing circuit for a DVM and explain how it operates.

**OR.**

- 7 (a) Explain about the following detection methods used in AC voltage measurement:  
(i) Synchronous detection.  
(ii) Peak to peak detection.  
(b) What would a true RMS reading voltmeter indicate, if a pulse waveform of 5 V peak with a duty cycle of 25% is applied to it?

Contd. in page 2

**UNIT – IV**

- 8 (a) Four arms of a Wheatstone bridge are as follows  $AB = 100 \Omega$ ,  $BC = 10 \Omega$ ,  $CD = 4 \Omega$ ,  $DA = 50 \Omega$ . The galvanometer has a resistance of  $20 \Omega$  and is connected across  $BD$ . A source of  $10 \text{ V DC}$  is connected across points  $AC$ . Find the current through the galvanometer. What should be the resistance in the arm  $DA$  for resulting in zero current through the galvanometer?
- (b) What is vector impedance meter?

**OR**

- 9 A four terminal resistance of approximately  $50 \mu\Omega$  was measured by Kelvin's double bridge. The bridge has the following component resistance. Standard resistance =  $100.03 \mu\Omega$  Inner ratio arms =  $200.48 \Omega$  and  $300 \Omega$  Outer ratio arms =  $200.62 \Omega$  and  $400 \Omega$  The resistance of the link connecting the standard and unknown resistance =  $600 \mu\Omega$ . Calculate the unknown resistance.

**UNIT – V**

- 10 Explain the operation of twin T-admittance measurement method employed in RF range with necessary mathematic expression in support of your answer.

**OR**

- 11 Write short notes on:
- (a) Automatic gain control.
- (b) Microwave transistor oscillator.

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