Printed Pages : 2

EEC-403

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 131403

Roll No.

B. Tech.

(SEM. IV) THEORY EXAMINATION, 2014-15

ELECTRONIC INSTRUMENTATION AND MEASUREMENTS

Time : **3** Hours] [Total Marks : **100**

Note : (1) Attempt rill questions .
(2) All questions carry equal marks.

1 Attempt any four parts of the following : **5×4=20**

a) Determine the dimensions of Magnetic Flux density, Electric field Strength. Explain the absolute error and Gross error.

b) Current was measured during a test as 30.4A, flowing in a resistor of 0.105 Ω It was discovered later that the ammeter reading was low by 1.2 percent and the marked resistance was high by 0.3 percent, Find the true power as a percentage of the power that was originally calculated.

c) Explain the construction and working of Galvanometer.

d) What is the effect' of temperature change in Ammeter and Voltmeter? How can we minimize the temperature effect in Ammeter and Voltmeter?

e) A PMMC instrument has a three resistor ayrton shunt connected across it to make an ammeter. The resistance values are $0.05\,\Omega$, $0.45\,\Omega$ and $4.5\,\Omega$. The meter resistance is 1 KΩ and FSD is 50μ.A. Calculate the three ranges of ammeter.

f) How can we measure unknown resistance using Series Ohmmeter?

2 Attempt any four parts of the following : **5×4=20**

a) Draw and explain `the circuit diagram of Voltage to current converter with full wave rectifier AC electronic Voltmeters.

b) Explain the working of FET Input Voltmeter with its circuit diagram.

c) Draw and explain the block diagram of the Ramp Type DVM with its system waveform.

d) What are the two methods of measuring current using high current probes of multimeter?

e) Compare Digital and Analog Multimeter. Explain the concept of Burden Voltage.

f) A digital frequency meter has a time base derived from 2MHz clock generator frequency divided by decade counters. Determine the measured :frequency when 3.524 kHz sine wave is applied and when the time bases uses i) Six - decade counters ii) four decade counters.

3 Attempt any two parts of the following : **10×2=20**

a) Explain the working of Q-meter. What is the measuring procedure for high impedance measurement in Q-meter?

b) Explain the Kelvin Bridge for unknown resistance measurement method. A wheat stone bridge has

P= 3.5KΩ, Q=7KΩ and S = 4KΩ when R= 2KΩ. Resistors are arranged in such a way that the bridge is in balanced condition. The supply voltage is 10V and galvanometer has a current sensitivity of 1μA/mm and its resistance is 2.5KΩ. Calculate the minimum change in R which is detectable by the bridge.

c) Write short note on :
   i. Series resistance Capacitance Bridge also draws its phasor diagram.
   ii. Hay Inductance Bridge and its application.

4 Attempt any two parts of the following : **10×2=20**

a) Draw the block diagram of automatic time base of oscilloscope. Show the waveforms and explain its operation.

b) write a short note on
   i) DSO operation
   ii) 1:1 oscilloscope probes.

c) Draw and explain the block diagram of Delayed- time-base (DTB) system, Show the system waveforms.

5 Attempt any two parts of the fallowing : **10×2=20**

a) Draw and explain the circuits for calibration of d.c. voltmeter and wattmeter with standard instruments.

b) Describe with the help of block diagram the operation of X-Y recorder. Also list the application of X-Y recorder.

c) Write a short note on
   i. Galvanometric strip chart recorders
   ii. Plotters.