BITS PILANI DUBAI CAMPUS
KNOWLEDGE VILLAGE
III Year EIE – II Semester 2006-07
ELECTRONIC INSTRUMENTS & INSTRUMENTATION TECHNOLGY
INSTR UC355
TEST 2(Open Book)

Date: 22/04/07 Time: 50mts
Max. Marks: 30 Weightage: 15%

Answer ALL Questions

1. Give the specifications of Strip chart recorder. (4M)

2. Define various types of Jitters with the help of a diagram. (4M)

3. Design a fast switching direct analog synthesizer to generate output between 1 and 5.7 MHz given a clock of 1 MHz.. (7M)

4. Design a programmable decade indirect synthesizer to synthesize an output of 8.46 MHz from a reference source of 2 MHz. (5M)

5. Explain how the following are displayed on spectrum analyzer.
   (i) Pure sinusoid with no modulation
   (ii) Amplitude modulation
   (iii) Frequency modulation
   (iv) Harmonic distortion (5M)

6. The input channel noise is 250 μV where the signal has 2mV rms noise over the bandwidth of the front end of the computer. The counter measures a 2 MHz sine wave with 1S gate time. The ± 1 count error is 0.001 Hz. The input rises to 350 mV in 1 μS. Find the displayed frequency resolution. (5M)

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COMPREHENSIVE EXAM

Date: 20/05/07 Time: 3 Hrs
Max. Marks: 50 Weightage: 25%

Answer ALL Questions

1. (a) Differentiate between curvilinear, rectilinear and pseudo rectilinear recodings. (3M)
   (b) Draw the block diagram of an Arbitrary waveform generator. Explain its operation. What is meant by vertical resolution. (7M)

2. (a) Explain with a block diagram how individual harmonic components are measured. (5M)
   (b) Suggest an analyzer to perform FFT analysis of RF signals. Explain the same. (5M)

3. (a) Explain the terms Interpolation and Arming. (3M)
   (b) Briefly discuss any TWO basic grounding practices. (3M)
   (c) With reference to circuit design, discuss the following:
   (i) Reliability (ii) High speed design (4M)

4. (a) What is HART field communication protocol. Explain. (4M)
   (b) With the help of figures differentiate between Direct digital control, Distributed control system and Fieldbus system. (3M)
   (c) Explain the architecture of Foundation field bus. (3M)

5. (a) What are pressurized enclosures. Explain. (5M)
   (b) Write short notes on soldering techniques. (5M)

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III Year EIE – II Semester 2006-07

ELECTRONIC INSTRUMENTS & INSTRUMENTATION TECHNOLGY

INSTR UC355

QUIZ 2

Date: 12/04/07
Max. Marks: 10

Time: 30mts
Weightage: 10%

Answer ALL Questions

1. Differentiate between a Recorder and Data logger.

2. Name FOUR PMMC writing mechanisms.

3. Show the output trace of a rectilinear recorder.

4. Digital recorder use _____ motors to move the pens in X and Y directions.

5. With the help of figures, show transition time and linearity.

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TEST 1

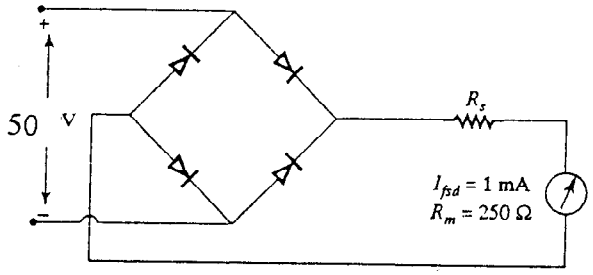
Date: 11/03/07
Max. Marks: 40

Time: 50mts
Weightage: 15%

Answer ALL Questions

1.(a) The deflection of the pointer depends on the parameters which are temperature dependent. How do you compensate for this. (5M)

(b) Derive the expression for the sensitivity. Calculate the value of the multiplier resistor for a 50V rms ac range on the voltmeter shown in the figure. (5M)



2. (a) Draw the circuit of a dual slope A/D converter and explain the working. (6M)

(b) Explain the following specifications of DMM.
(i) NMRR (ii) Repeatability (iii) Zero or offset (iv) Frequency response. (4M)

3. (a) Explain the sampling methods used in digital oscilloscopes. (5M)

(b) What are the different acquisition modes in a digital oscilloscope. Explain. (5M)

4. Using Hay's bridge find the unknown inductance and resistance of the network that causes a null with the following bridge arms. Derive the necessary equations.

$\omega = 3000$ rad/s, $R_2 = 10k\Omega$, $R_1 = 2k\Omega$, $C_1 = 1\ \mu F$, $R_3 = 1K\omega$ (10M)

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III Year EIE – II Semester 2006-07

ELECTRONIC INSTRUMENTS & INSTRUMENTATION TECHNOLGY

INSTR UC355

QUIZ 1

Date: 22/02/07 Time: 30mts

Max. Marks: 10 Weightage: 10%

Answer ALL Questions

1. Draw the figure showing the effect of damping on the deflection of the moving system when a step input is applied.

2. What are the common sources of error encountered in PMMC instrument.

3. What re the disadvantages of a PMMC instrument.

4. AC sensitivity of the voltmeter is defined as _____ and dc sensitivity is defined as _____.

5. In a half wave rectified base meter, a 30μA meter movement has an internal resistance of 40Ω and is to be used in a range of 0-30V. Find R_S.

6. Draw the circuit of a loaded peak detector.

7. Draw the circuit for measurement of very low currents.

8. Define Form factor.

9. Define V_{LSB} mathematically.

10. Give any TWO disadvantages of weighted resistor D/A converter.