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TIC – 802

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

PAPER ID : 0396 Roll No. | | | | | | | | | | |

B.Tech.

(SEM VIII) EVEN SEMESTER THEORY EXAMINATION, 2009-2010

DIGITAL MEASUREMENT TECHNIQUES

Time : 3 Hours *Total Marks : 100*

1. Attempt **any four** parts of the following : **(4x5=20)**

(a) Discuss the advantage and disadvantage of a digital display compared to an analog one.

(b) If the main and Vernier Oscillators have time periods of 10.006 and 10.001 μs, respectively, and the time interval to be measured is 1410.05 μs. What would be the reading of the main and the vernier counters ? Find the total measurement time.

(c) Explain the measurement of time interval smaller than the clock period.

(d) Using Phase measurement scheme explain Phase measurement at a single low frequency.

(e) Derive a expression for Quality factor of a ringing circuit ?

(f) Write a short note on Decibel meter.

2. Attempt **any two** of the following : **(2x10=20)**

(a) Using block diagram explain the measurement of the ratio of two frequencies and product of two frequency.

(b) Explain the Average Frequency difference Measurement techniques and Applications.

(c) Describe the basic method used for Fast low Frequency Measurement.

3. Attempt **any two** of the following : **(2x10=20)**

(a) Define digitally programmable resistors and its applications

(b) Write a short note on programmable gain amplifier. Design a programmable gain amplifier for the gain 1, 1/2, 1/3, 2/3.

(c) Give a comparison between two SC biquads. Explain with circuit of Biquad 1 using switch capacitor and find out its transfer function

4. Attempt **any two** of the following : **(2x10=20)**

(a) Realize 2 bit inverting and non inverting DAC with a minimum number of components making use of the programmable gain amplifier.

(b) Realize 16 bit DACs with the minimum spread and the minimum total resistance. Draw a weighted reference voltage DACs.

(c) Explain minimum total resistance DAC realization. Design 4 bit DAC that have the least possible spread and the least number of resistors.

5. Attempt **any two** parts of the following : **(2x10=20)**

(a) Draw a block diagram of ADC employing VTC and VFC.

(b) Draw a block diagram for digital ramp ADC and successive approximation ADC. In a 6 bit successive approximation converter, if the full scale value represents 1v and the unknown voltage vx = 55/64 v, find the various vn Plot un versus n.

(c) Write short notes on :

(i) Sampling theorem and Quantization

(ii) Time Division Multiplexing.

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