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

PAPER ID : 0396 Roll No.

B. Tech.

(SEM. VIII) EXAMINATION, 2008-09

DIGITAL MEASUREMENT TECHNIQUES

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

Note : Answer **all** questions.

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

(a) Discuss philosophy of digital measurement. **5**

(b) Describe in brief microcontroller based difference meter, with a block diagram. **5**

(c) Determine the maximum percentage error in measuring a time interval of 2.2 μ s with a clock frequency of 1 MHZ. **5**

(d) The periods of main and vernier osillators of a time interval meter are 10.005 μ sec and 10000 μ sec respectively. Determine the resolution of meter, maximum vernier count. **5**

(e) Explain the working principle with neat diagram of decibel meter. **5**

(f) Write short note on Very Low Time Measurement. **5**

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

(a) Explain a Digital Technique for frequency measurement. Is the technique suitable for measurement of microwave frequencies of the range 3-30 GHz? Justify. **10**

(b) What are the specific problems for Low Frequency Measurement? **10**

(c) Write short notes on the following : **5**

(i) Voltage to Time Convertor and its applications.

(ii) Programmable biquads. **5**

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

(a) Explain series and parallel realization of digital programmable resistors.

(b) Explain with block diagram, working of a digital ohm meter.

(c) Describe in brief programmable gain amplifiers and its application.

4 Attempt any **two** of the following:

(a) With a circuit diagram explain the operations of an integrable weight current, differential current output D/A converter.

(b) Explain how DACs can be derived from Programmable Gain Amplifier.

(c) Write a note on Digitally Programmable Analog filters.

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

(a) Which type of A/D converters do the common hand held Digital Multimeters use? Expain the working of such A/D converters with a block diagram. Estimate the conversion time (average).

(b) What is sampling theorem? If a sine-wave voltage waveform of frequency w is sampled with sampling rate of 10 w with flat top. Samples of duration 1/20 w, sketch, the output frequency spectrum.

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(c) Write short notes on :

(i) Quantization

(ii) Quality factor of ringing circuit.
