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SE-7401

B. E. IV (Sem. VII) (Elect.) Examination

April / May – 2011

Electrical Instrumentation

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

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. 4 (Sem. 7) (Elect.)**

Name of the Subject :

☛ **Electrical Instrumentation**

☛ Subject Code No. : **7 4 0 1** ☛ Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

(2) Attempt all questions.
(3) Figures to the right indicate full marks.
(4) Assume suitable data if required.

1 (a) Attempt following questions : **5**

(1) Why do we need driver and decoder in case of digital measurement ?

(2) Why do we need quantization in case of digital measurement ?

(3) What is the function of sample and hold circuit ?

(4) Why do we convert any quantity being measured digitally into time of frequency first ?

(5) What is ratio metric measurement ?

(b) State "True" of "False" for the following sentences : **5**

(1) VTC is a part of ADC.

(2) Dual slope VTC is more affected by noise compared to single slope VTC.

(3) Sampling and hold circuit is required for DACs.

(4) Accuracy of digital instrument decreases by increasing number of bits.

(5) Quantization error decreases with decrease in step size.

(c) (1) Discuss digital type ADC employing DAC with block diagram. **5**

(2) Discuss digital measurement of phase difference. **5**

2 (a) Explain tan-δ meter. **5**

(b) Discuss advantages of digital measurement techniques. **10**

OR

2 (a) Discuss successavie approximation type ADC in detail. **10**

(b) Explain the process of quantization in case of ADC. **6**

3 Attempt any (two) : **14**

(1) Write a short note on "Single slope type VTC". What causes error in it ?

(2) Discuss applications of fiber optics.

(3) Write a short note on Q-factor meter.

4 (a) Answer the following questions : **5**

(1) What is the gain of buffer amplifier ?

(2) What is 'frequency modulation' ?

(3) Which DAC has got better accuracy ? Why ?

(4) List various pulse code formats used in digital signal transimission.

(5) What is frequency division multiplexing ?

(b) State "True" or "False" for the following sentences : **5**

(1) Instrumentation amplifier should have very low CMRR.

(2) Digital to analog conversion needs sample and hold circuit.

(3) R-2R ladder type DACs have lesser accuracy compared to binary weighted ladder type DAC.

(4) FM has got more bandwidth compared to FM transimission.

(5) No pulse is transmitted for 'O' in data in 'half binary' transmission.

(c) What is DAC ? Why digital to analog converters are required in industries ? Explain R-2R ladder type DAC and list its properties. **10**

5 What is an instrumentation amplifier ? What are properties of a good instrumentation amplifier ? Explain instrumentation amplifier realized with three op-amps. How does it differ from an ordinary op-amp ? **8**

OR

5 (a) Explain various modulation techniques used in digital signal transmission. **12**

(b) Discuss in brief sample and hold circuits.

6 Attempt (any three) : **18**

(1) Write a short note on 'FFT'.

(2) Discuss various pulse code formats used in digital signal transmission.

(3) Write a short note on sine wave generators.

(4) Discuss : Hartely's oscillator.
