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RM-7783

B. E. IV (Sem. VIII) (IC) Examination

May / June – 2010

Instrumentation System & Interfacing

Time : 3 Hours] [Total Marks : 100

Instruction :

(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. 8) (IC)**

Name of the Subject :

☛ **Instrumentation System & Interfacing**

☛Subject Code No. : **7 7 8 3** ☛Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

(2) Answers to each section must be written in separate answer books.
(3) Figures to the **right** indicate maximum marks.
(4) Draw neat figure wherever required.

SECTION I

Q1 **(i)** Explain near and fare field interference. **2**

(a) **(ii)** Mention most common sources of capacitive interference in the laboratory **1**
(iii) What are the basic quantities of electrical world **1**
(iv) List out the types of cable and give the explanation about hook up cable **2**
(v) Explain characteristic values **2**
(vi) Who do you mean by impedance matching **2**

(b) Derive the condition for maximum power transfer for an electrical circuit and also explain the same with suitable example **8**

Q2 **(a)** Explain mechanically interference and its elimination technique **8**

(b) Explain different types of switches use in application explain Toggle & Rotary switch **8**

OR

(a) Explain electromagnetic interference and its elimination technique **8**

(b) Distinguish between fuses and circuit breakers. **8**

Q3 **(a)** Explain ground fault circuit interrupter and immersion detection circuit interrupter **8**

(b) Explain following : **8**
(i) Common –mode noise voltage
(ii) Explain electrical charge and current

OR

(b) A test lead is connected to an instrument that has 2MΩ input impedance and to a circuit that has 2 MΩ output impedance. If 1 MV rms signal is induced in the lead from 60HZpower line, what is the capacitance that must exist between lead and power line **8**

SECTION II

Q-4 (a) Express your views on the definitions of interfacing and its classification. Discuss the elements of analog system in detail. (5)

(b)Define following (4)

(a)Aperture time
(b)Droop
(c)Fed Through
(d)Acquisition

(c)Explain multiplexer and their each parameter in detail. (9)

Q-5. (a) What is HART protocol? Describe its features and protocol structure in detail (10)

(b) Explain data line monitor in detail (6)

OR

Q-5(a) Explain analog systems and 20 mA current loop (8)

(b) Explain the following term for signal conditioning circuit (8)

i. Offsetting
ii. Filtering
iii. Buffering
iv. Linearization

Q-6 Attempts any two (16)

(1) Explain following terms for multiplexers

- settling time
- cross talk
- Give 16 BIT, 10 V full scale successive approximation A/D converter that has 40 μS conversion time and is used without a sample and hold circuit, find the maximum rate of change the input signal and maximum input frequency that will allow A/D to operate at full resolution.

(2) CAMAC interface

(3) Discuss IEEE 488 bus standard with its characteristics