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SE-7421

B. E. - IV (Sem. VII) (Instumentation & Control) Examination

May / June – 2011

Digital & Distributed Control System

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. - IV (Sem. VII) (I.C.)**

Name of the Subject :

☛ **Digital & Distributed Control System**

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

Seat No. :

Student's Signature

(2) Answers to each section must be written in separate answer books.

(3) Figure to the right indicate maximum marks.

(4) Draw neat figure wherever required.

SECTION - I

1 Answer the short questions.

(i) What is group display ? **3**

(ii) Define Reliability. **2**

(iii) List out the important criteria for communication cable which connect field devices with computer system. **2**

(iv) What is Overview display ? **3**

(v) Draw symbolic diagram for following : **4**

(i) Temperature loop : Computer control, analog back up.

(ii) Flow loop : shared display/shared control, supervisory set point control via communication link.

2 Attempt any **two**. **18**

(a) Explain cost estimation procedure for DCS system with suitable example.

(b) Discuss position algorithm in detail with their limitations.

(c) Explain : Hierarchical computer structure for a large manufacturing complex.

3 Attempt any **three** : 18

(a) Explain parallel design and sequential design of experiments in context of empirical process control.

(b) Discuss following digital algorithms.
  (i) Feed-forward control
  (ii) Error squared
  (iii) feedback control.

(c) Brief about DCS software algorithm library.

(d) Draw block diagrams of
  (i) Direct digital control system
  (ii) Distributed control system.

SECTION - II

4 Answer the short questions. (Each question is of **2** marks) 14

(i) Give comparison between RS-232 and RS-485 data interface method.

(ii) State the disadvantages of fiber optical cable.

(iii) Brief about 20 mA current loop interface.

(iv) What is Daisy chain networking ?

(v) List out any four selection criteria for multiplexer unit.

(vi) Draw the diagram of direct digital computer system.

(vii) What is SCADA ?

5 Attempt any **two**. 18

(a) Compare multi-channel possibilities of Data acquisition systems with the help of block diagram (any **three**).

(b) What are the aims of Field bus standardization ? Give the structure (block diagram) for proposed international field bus.

(c) State important characteristics of multiplexer designs. Explain radial, remote and party line multiplexing systems.

6 Attempt any **three**. 18

(a) Give comparison between MODBUS, PROFIBUS and FIPBUS protocol.

(b) Discuss HART protocol in detail.

(c) Discuss features of keyboard used for DCS.

(d) Discuss Interfacing of PC with DCS and Interfacing to PLC with DCS.