53 (IE 810) VTIS

2014

VIRTUAL INSTRUMENTATION

Paper : IE 810

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions out of **seven.***

1. *(a)* What is virtual instrumentation and why do we need it ? 5

   (b) Explain the PC based Data Acquisition System with neat block diagram. 10

   (c) Explain the concept of virtual instrumentation with help of its architecture. 5

2. *(a)* Explain the Sampling theorem. Explain the necessity of the Sampling & Quantization in virtual instrumentation. 5

(b) Explain the Sample & Hold circuits with neat diagram. 5

(c) A temperature between 100°*C* and 300°*C* is converted into a 0 to 5·0*V* signal. This signal is fed to an 8-*bit* ADC with a 5·0*V* reference. What is the actual measurement range of the system ? What is the resolution ? What hex output results from 169°*C* ? 6+2+2

3. (a) Write a block diagram programming to find out whether the given number is odd or even using LabVIEW. 6

(b) Write a program in LabVIEW to convert the °*C* reading in °*F* reading for the measurement of temperature. 6

(c) Give the block diagram construction steps to find the sum of 10 natural numbers using "For loop" as well as using "While loop". 8

4. (a) How the P-I-D controller is designed in LabVIEW ? Explain briefly. 10

(b) Split an input string "CIT KOKRAJHAR" into two outputs with reference to a separating character. Find the length of input and reverse the string. 5

(c) What is a SUB VI ? How it is generated in LabVIEW ? 5

5. Draw the LabVIEW block diagram and front panel to simulate the level measurement process having the proportional controller equation on —

$$y = k(u - b)$$

where, y = level of the tank

u = set point

b = measured signal

k = controller gain.

How the measurable data can be written into the computer and read from the computer using LVM format. Discuss with neat sketch. 20

6. (a) Compare the features of RS 232, RS 422, and RS 485. 6

(b) What is Mod bus ? List the advantages of Mod bus. 4

(c) Explain in detail about USB standards with its types. 10

7. Write short notes on : ***(any four)*** 4×5=20

(a) Case structure in LabVIEW

(b) Shift register

(c) IEEE 488·2 bus

(d) Local variable and Global variable

(e) Array *vs* clusters

(f) Formula nodes.