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)* Explain the Sampling theorem. Explain the necessity of the Sampling & Quantization in Virtual Instrumentation. 10

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

   (c) Determine the output voltage caused by each bit in a 6 bit $R-2R$ ladder DAC if the input levels are $O = 0 \cdot V$ and $I = +16V$. Also determine the resolution and full scale output of the network. 5

2. *(a)* Define Virtual Instrumentation. State the advantages of Virtual Instrumentation. 2+3=5

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

(c) Explain the typical DAQ card and universal DAQ card. 5

3. *(a)* Give the block diagram construction steps to find the factorial of a given number using "For loop' as well as using "While loop". 8

(b) Write a block diagram programming to find out whether the given number is odd or even using LABVIEW. 4

(c) Design a sub VI of a ON/OFF controller. 8

4. *(a)* Split an input string into two outputs with reference to a separating character. Find the length of input and reverse the string. 5

(b) How the operation of a CRO is implemented in LabVIEW ? 5

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

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 TDMS format. Discuss with neat sketch. 20

6. (a) Compare the features of RS 232, RS 422 and RS 485. 5

(b) Explain the 7-layer ISO-OSI model for serial bus. 10

(c) What is Mod bus ? List the advantages of Mod bus. 5

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

(a) Sub VI

(b) Selection structure

(c) IEEE 488·2 bus

(d) Auto indexing

(e) Local variable and global variable

(f) Array *Vs* clusters.