

Total number of printed pages-4

53 (IE 810) VTIS

2017

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 concept of Virtual Instrumentation with the help of its architecture. 10
- (b) Explain the typical DAQ card and universal DAQ card. 5
- (c) Explain the Sample and Hold circuits with neat diagram. 5
2. (a) Explain the Sampling theorem. Explain the necessity of the sampling and quantization in Virtual instrumentation. 2+8

Contd.

- (b) Define the MOD Bus and CAN Bus. 5
- (c) Determine the output voltage caused by each bit in a 6 bit R-2R ladder DAC if the input levels are $0=0V$ and $1=+16V$. Also determine the resolution and full scale output of the network. 5
3. (a) Build a VI which consists of numeric input array. Set a threshold value and separate the array elements which are greater than the threshold. Create an icon and connector and save this VI as sub VI. Write all the necessary steps for block diagram. 10
- (b) What is sub VI? With the help of an example properly describe the operation of reusing of the sub VI. 5
- (c) Give the block diagram construction steps to find the factorial of a given number using "For Loop" and "While loop". 5
4. (a) Explain the typical features and advantages of LabVIEW. 5
- (b) Using LabVIEW Software convert a binary number to a decimal number. 5

- (c) How the P-I-D controller is designed in LabVIEW? Explain with step by step procedure. 10
5. Draw the LabVIEW block diagram and front panel to simulate the level measurement process having a proportional controller equation —
- $$y = K(u - b)$$
- 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. 5
- (b) Explain the 7 Layer ISO-OSI model for serial bus. 10
- (c) What is USB? Explain the functions of USB briefly. 5

7. Write short notes on the following: **(any four)** $4 \times 5 = 20$

- (a) IEEE 488.2 bus
- (b) Clusters in LabVIEW
- (c) Formula nodes and shift register
- (d) Auto indexing
- (e) Global and Local variable.