CBCS SCHEME

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20MCM333

Third Semester M.Tech. Degree Examination, Jan./Feb. 2023
Virtual Instrumentation

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Provide an overview of the historical development of instrumentation technology and systems. **(10 Marks)**

b. Create a visual representation of the layout and organisation of a virtual instrumentation system including all relevant components and their interconnections. **(10 Marks)**

OR

2 a. Describe the methods used for movement and processing of data in a system. **(10 Marks)**

b. Analyze and explain the benefits and advantages of using virtual instrumentation technology. **(10 Marks)**

Module-2

3 a. What are virtual instruments? Explain with an example. Also detail the functions and advantages of using sub-VIs. **(10 Marks)**

b. How does the use of local and global variables affect the program functionality and data integrity in LabVIEW. **(10 Marks)**

OR

4 a. What are arrays in VIs? Detail the steps in initializing array? Also describe the array functions and auto-indexing in relation to arrays. **(10 Marks)**

b. Explain the concept of clusters and elaborate on the cluster operations. **(10 Marks)**

Module-3

5 a. Give the overview of PC based data acquisition system over the years. **(10 Marks)**

b. Write the block diagram of a Data Acquisition System (DAQ). Explain each of its components in detail. **(10 Marks)**

OR

6 a. Classify and briefly explain the signals acquired by a DAQ. Also explain the problems associated with real world signals. **(10 Marks)**

b. Explain in detail the three basic types of hardware of a desktop DAQ system. **(10 Marks)**

Module-4

7 a. Explain General Purpose Interface Bus(GPIB) interfacing with the timing diagram of GPIB. **(10 Marks)**

b. Explain the role of PXI in the test, measurement and control of data. **(10 Marks)**

OR

8 a. What is RS232 interfacing? Explain the process of setting up of RS232 test system in LabVIEW. **(10 Marks)**

b. Explain various bus interfaces used to acquire data in virtual instrumentation. **(10 Marks)**

Module-5

9 a. What is a distributed I/O? Explain in detail with its advantages. **(10 Marks)**

b. How would you evaluate the effectiveness of using virtual instrumentation for simulating complex systems? **(10 Marks)**

OR

10 a. What are the key factors to consider when developing a control system using virtual instrumentation? **(10 Marks)**

b. How would you apply the acquired images in a virtual instrumentation system to extract meaningful data and improve the performance of control system? **(10 Marks)**

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