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| **Scheme of Valuation/Answer Key**  (Scheme of evaluation (marks in brackets) and answers of problems/key) | | | | | |
| **APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  V SEMESTER B.TECH DEGREE EXAMINATION, JULY 2019 | | | | | |
| **Course Code: AE361** | | | | | |
| |  | | --- | | **Course Name: VIRTUAL INSTRUMENT DESIGN** | | | | | | |
| Max. Marks: 100 | | | **B** | Duration: 3 Hours | |
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| **PART A** | | | | | |
|  |  | ***Answer any two full questions, each carries 15 marks.*** | | | Marks |
| 1 | a) | Block Diagram of A/D (1 Marks)  Sampling&Holding (3 Marks)  Quantisation (3 Marks)  Coding (3 Marks) | | | (10) |
|  | b) | DAC principle with block 3 Marks  Types of DAC 2 Marks | | | (5) |
| 2 | a) | Architecture4 Marks  Description of following 6 Marks  - Sensor module  – Sensor interface  – Information systems interface  – Processing module  – Database interface  – User interface | | | (10) |
|  | b) | Conventional (Text based) programming Vs graphical programming minimum write all possible difference. | | | (5) |
| 3 | a) | Virtual Instruments Vs Traditional Instruments  Any seven difference | | | (7) |
|  | b) | Any five advantage of digital signals over analog signals | | | (5) |
|  | c) | Sampling Theorem statement -3marks | | | (3) |
|  |  |  | | |  |
| **PART B** | | | | | |
| ***Answer any two full questions, each carries 15 marks.*** | | | | | |
| 4 | a) | PC based data acquisition system  (3 Marks)  Explanation-3 Marks | | | (6) |
|  | b) | Pull Up and Pull down Resistor--------------3 Marks  Voltage Divider-----------------------3 Marks  TTL to solid state logic-------------------3 Marks | | | (9) |
| 5 | a) | Arrays-3 Marks  Clusters-3 marks | | | (6) |
|  | b) | **Step 1:** Place a *Case* structure on the block diagram.  **Step 2:** Wire an input value to the selector terminal to determine which case executes.  **Step 3:** Place objects inside the *Case* structure to create subdiagrams that the *Case* structure can  execute. If necessary, add or duplicate subdiagrams. If the data type of the selector terminal is  Boolean, the structure has a TRUE case and a FALSE case. If the selector terminal is an integer,  string, or enumerated type value, the structure can have any number of cases.  **Step 4:** For each case, use the *Labeling* tool to enter a single value or lists and ranges of values  in the case selector label at the top of the *Case* structure. | | | (4) |
|  | c) | Basic structure of a state machine implemented inLabVIEW 2marks  Explanation of the infrastructure components -------3 Marks | | | (5) |
| 6 | a) | Formula node icon-----------2 Marks  Explanation --------------4 Marks | | | (6) |
|  | b) | Figure--------2 Marks  Explanation-------3 Marks | | | 5 |
|  | c) | Use the file I/O VIs and functions located to handle all aspects of file I/O, including the following:------------------------------------------2 Marks  ● Opening and closing data files  ● Reading data from and writing data to files  ● Reading from and writing to spreadsheet-formatted files  ● Moving and renaming files and directories  ● Changing file characteristics  ● Creating, modifying and reading configuration files Binary—Binary files are the underlying file format of all other file formats.  File formats--------------------------------2 Marks  Binary, ASCII, LVM, and TDM | | | (4) |
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| **PART C** | | | | | |
| ***Answer any two full questions,each carries 20 marks.*** | | | | | |
| 7 | a) | GPIB (IEEE488) Devices Configuration  Devices Talker, Listener, Controller----------2 Marks  Explanation of configuration Diagram Star &Linear----------------5Marks  Specification of connection-----------------------------3 Marks | | | 10 |
|  | b) | Explanation about USB Topology,application,USB host,Connectivity,configuration,Port etc. | | | 5 |
|  | c) | **Compare based on**  Line Configuration  Mode of operation  Maximum cable length  Maximum data rate  Typical logic level  Receiver input impedance  Receiver Sensitivity | | | 5 Marks |
| 8 | a) | Virtual Instrument Software Architecture (VISA) is the lower layer of functions in the LabVIEW  instrument driver VIs that communicates with the driver software. VISA by itself does not provide  instrumentation programming capability. VISA is a high-level API that calls low-level drivers.  (2 Marks)  (1 Mark)  VISA can control VXI, GPIB, serial, or computer-based instruments and  makes the appropriate driver calls depending on the type of instrument used. When debugging  VISA problems, remember that an apparent VISA problem could be an installation problem with  one of the drivers that VISA calls (2 Marks)  Advantages (3 Marks)  It uses many of the same operations tocommunicate with instruments regardless of the interface type  VISA is also designed so that programs written using VISA function callsare easily portable from one platform to another  The VISA function calls and their associated Parameters are uniformacross all platforms; software can be ported to other platforms and thenrecompiled.  VISA’s greatest advantage, perhaps, is that it is an easy language to learnand use. Its Object-oriented structure makes the language and its operationsintuitive to learn | | | 8 Marks |
|  | b) | About Fire ware (IEEE-1394) ----------2  Important features -----------------------------2 | | | 4 Marks |
|  | c) | PCI Bus- 4Marks  PCMCIA interface-4 Marks | | | 8 Marks |
| 9 | a) | Distributed I/O module definition---2 Marks  Diagram of any one distributed I/O system (Analog Devices 6B series) 3 Marks  Explanation 5 Marks | | | 10 Marks |
|  | b) | Block Diagram of Motion control System-3 Marks  Explanation about the components -7Marks | | | 10 Marks |
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