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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, DECEMBER 2018 | | | | | |
| **Course Code: AE361** | | | | | |
| |  | | --- | | **Course Name: VIRTUAL INSTRUMENT DESIGN** | | | | | | |
| Max. Marks: 100 | | |  | Duration: 3 Hours | |
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| **PART A** | | | | | |
|  |  | ***Answer any two full questions, each carries 15 marks.*** | | | Marks |
| 1 | a) | Explain in detail about the representation of analog signals in the digital domain.  *Explanation- 2Marks;Diagram- 1 Mark* | | | (3) |
|  | b) | Give a detailed note on Digital Instrumentation and its advantages.  *Digital Instrumentation- 2 M; Advantages (any 4, each carries 0.5 M)- 2 Marks* | | | (4) |
|  | c) | With neat diagram explain the working and differences of a 3 bit R-2R ladder DAC and 3 bit binary weighted resistor network DAC.  *Working- 6 Marks (R-2R: 3 Marks, BWR: 3 Marks); Differences- 2 Marks* | | | (8) |
| 2 | a) | How a successive approximation ADC works? Explain with neat diagrams.  *Working- 2Marks;Diagram- 3 Marks* | | | (5) |
|  | b) | What is the significance of ADC in digital instrumentation? List any four ADC’s.  *Explanation- 1 Marks; List of ADC’s- 2 Marks (Each carries 0.5 M)* | | | (3) |
|  | c) | How a Virtual Instrument differs from Traditional Instrument? Draw the schematic of both.  *Differences- 4 Marks; Schematic- 3 Marks* | | | (7) |
| 3 | a) | LabVIEW follows a data flow technique for running VI’s. Explain with an example.  *Explanation- 3 Marks; Example- 2 Marks* | | | (5) |
|  | b) | What are the advantages of graphical programming over conventional programming techniques?  Any 5 advantages- 5 Marks | | | (5) |
|  | c) | With a neat diagram explain the architecture of VI.  *Explanation- 2Marks;Diagram- 3 Marks* | | | (5) |
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| **PART B** | | | | | |
| ***Answer any two full questions, each carries 15 marks.*** | | | | | |
| 4 | a) | Discuss about a multidimensional array. How is it differs from one-dimensional array?  *Discussion on MDA- 2 Marks; Differences- 2 Marks* | | | (4) |
|  | b) | What is a For Loop? Under what circumstances are For Loops used?How does a While Loop vary from a For Loop?  *Explanation of For loop- 2 Marks; Use of for loop- 2 Marks; Differences- 2 Marks* | | | (6) |
|  | c) | How a case structure and sequence structure differs? Explain with necessary examples.  *Differences- 2Marks;Diagram- 3 Marks* | | | (5) |
| 5 | a) | Explain in detail about publishing of measurement data in web. How it can be done with LabVIEW?  *Explanation- 4 Marks* | | | (4) |
|  | b) | How a cluster differs from array?  *Differences- 3 Marks* | | | (3) |
|  | c) | How a typical PC based Data Acquisition System works? Explain in detail with neat block schematic.  *Explanation- 4 Marks;Diagram- 4 Marks* | | | (8) |
| 6 | a) | What is meant by resolution of data acquisition system?  *Explanation- 3 Marks; Equation- 2 Marks* | | | (5) |
|  | b) | Explain in detail about DMA transfer mechanism with neat schematic. List its 3 types of data transfer operations.  *Explanation- 4 Marks; Diagram- 3 Marks; Types- 3 Marks* | | | (10) |
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| **PART C** | | | | | |
| ***Answer any two full questions,each carries 20 marks.*** | | | | | |
| 7 | a) | Write a short note on USB interface.  *Short note- 4 Marks* | | | (4) |
|  | b) | Explain GPIB bus topology with neat schematic.  *Explanation- 5 Marks;Diagram- 2 Marks* | | | (7) |
|  | c) | Describe the following:  (a) SCSI  (b) PXI  (c) Ethernet control of PXI  *SCSI- 3M; PXI- 3M; Ethernet Control of PXI- 3M* | | | (9) |
| 8 | a) | Describe the basic operations and programming under VISA.  *Explanation- 6 Marks* | | | (6) |
|  | b) | Define VXI bus interface and its merits.  *Definition- 2 Marks; Merits- 2 Marks* | | | (4) |
|  | c) | Explain about Motion control system using VI with a neat schematic  *Explanation- 6 Marks; Schematic- 4 Marks* | | | (10) |
| 9 | a) | Explain the development of a control system using VI.  *Explanation- 6 Marks;Diagram- 4 Marks* | | | (10) |
|  | b) | Describe the development of process database management system using VI.  *Explanation- 6 Marks;Diagram- 4 Marks* | | | (10) |
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