|  |
| --- |
| **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 |
|  |
| **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) |
|  |  |  |  |
| **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) |
|  |  |  |  |
|  |  |  |  |
| **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) |
|  |  |  |  |
| \*\*\*\* |