Registration No : | | | | | | | | | | |

Total Number of Pages : 03 **B.Tech.**
PEI6J001

6th Semester Regular Examination 2017-18
INTELLIGENT & VIRTUAL INSTRUMENTATION
BRANCH : AEIE, EIE, IEE
Time : 3 Hours
Max Marks : 100
Q.CODE : C353

Answer Part-A which is compulsory and any four from Part-B.
The figures in the right hand margin indicate marks.

Part – A (Answer all the questions)

Q1 **Answer the following questions : *multiple type or dash fill up type :*** **(2 x 10)**

a) What is the Fuzzy Approximation Theorem(FAT)
a) A fuzzy system can model any continuous system
b) The conversion of fuzzy logic to probability.
c) A continuous system can model a fuzzy system.
d) Fuzzy patches covering a series of fuzzy rules.

b) Fuzzy logic has rapidly become one of the most successful of today's technologies for developing sophisticated control systems. The reason for this is :
i. Fuzzy logic resembles the human way of thinking.
ii. Fuzzy logic enables the ability to generate precise solutions from certain or approximate information.
iii. Fuzzy logic is easy to implement.
a) i & ii & iii
b) i & ii
c) ii & iii only
d) none of the above

c) A perceptron is:
a) a single layer feed-forward neural network with pre-processing
b) an auto-associative neural network
c) a double layer auto-associative neural network
d) a neural network that contains feedback

d) Which is true for neural networks?
a) It has set of nodes and connections
b) Each node computes it's weighted input
c) Node could be in excited state or non-excited state
d) All of the mentioned

e) Neuro software is:
a) A software used to analyze neurons
b) It is powerful and easy neural network
c) Designed to aid experts in real world
d) It is software used by Neuro surgeon

f) Neural Networks are complex _____ with many parameters.
a) Linear Functions
b) Nonlinear Functions
c) Discrete Functions
d) Exponential Functions

g) Before connecting a sensor to your DAQ device, it is important to know the _____ of your device.
a) Device Pinouts
b) Signal Routing
c) Connection Diagram
d) User Manual

h) If you are plotting a large array of data at one time, and you want the previous data that was displayed to be removed before plotting new data, use a _____.
a) Waveform Chart
b) Waveform Graph

i) To analyze a signal in the frequency domain, you must first calculate the FFT of the time domain signal. In LabVIEW, you can accomplish this using the _____ Express VI.
Spectral Measurements
a) Filter
b) Statistics
c) Amplitude and Level Measurements

j) To incorporate C or C++ structured code into LabVIEW, it is best to use the _____.
a) MathScript Node
b) Formula Node

Q2 **Answer the following questions : *Short answer type :*** **(2 x 10)**

a) What are BUS utility signal in LabVIEW ?

b) What do you mean by Perceptron ?

c) Merits of graphical programming over conventional programming.

d) What do you mean by Recurrent neural network?

e) What can you use a shift-register for?

f) Which is the preferred method of exchanging data between different while-loops in a diagram?

g) What is the purpose of a LLB-file?

h) What does it mean that Field Point is a distributed I/O-system?

i) The _____ automatically populates a list of all variables in the equation for possible output terminals.
a) Math Script Node
b) Formula Node

j) To see if a measured signal has exceeded a threshold in LabVIEW, you can use the Mask and Limit Testing Express VI. When plotting the Tested Signals output, the Threshold/Limit is also plotted.
True or False?

Part – B (Answer any four questions)

Q3 **a)** Describe Fuzzy Interval arithmetic, manipulating Fuzzy numbers in details with examples. **(10)**

b) Describe RBF networks. **(5)**

Q4 **a)** Describe Threshold logic unit as a model of a Biological Neuron. **(10)**

b) Explain the forward dynamics identification scheme in Adaline. **(5)**

Q5 **a)** Explain Back propagation algorithm with example. **(10)**

b) Describe Perceptron learning algorithm. **(5)**

Q6	**a)**	Explain Neural Fuzzy identification scheme of a nonlinear dynamical system.	**(10)**
	b)	Explain the working in DAQmx.	**(5)**
Q7	**a)**	Write in detail about LOOPs and CHARTs in LabVIEW. Explain in detail with examples.	**(10)**
	b)	Describe a state machine with a suitable example	**(5)**
Q8	**a)**	Describe the Data acquisition and interfacing in Virtual Interfacing with suitable examples.	**(10)**
	b)	Distinguish between practical and ideal virtual interfacing.	**(5)**
Q9	**a)**	Explain the inter conversion of arrays and clusters in LabVIEW.	**(10)**
	b)	Explain GPIB interfacing.	**(5)**