16CS5A1

USN | | | | | | | | | | |

RV COLLEGE OF ENGINEERING®

(An Autonomous Institution affiliated to VTU)

V Semester B. E. Examinations Nov/Dec-19

Computer Science and Engineering

ARTIFICIAL NEURAL NETWORKS (ELECTIVE)

Time: 03 Hours ***Maximum Marks: 100***

Instructions to candidates:

1. Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only.
2. Answer FIVE full questions from Part B. In Part B question number 2, 7 and 8 are compulsory. Answer any one full question from 3 and 4 & one full question from 5 and 6

PART-A

1	1.1	Define Neural Network.	02
	1.2	List the three learning strategies in neural network.	02
	1.3	Draw the diagram of recurrent network with no self feedback loops	02
	1.4	Give the principle of working of least mean square algorithm.	02
	1.5	Define generalization.	02
	1.6	List any two heuristics which will significantly improve the back propagation algorithm.	02
	1.7	Define discrete convolution.	02
	1.8	Which are the different formats of data used with convolutional networks?	02
	1.9	Draw an illustrative diagram of how a factor graph can resolve ambiguity in the interpretation of undirected networks.	02
	1.10	Compare undirected graphical models with directed graphical models.	02

PART-B

2	a	Give the purpose of activation functions. Explain in detail three activation functions.	08
	b	Explain the following with all necessary equations: i) Competitive learning ii) Hebbian learning.	08
3	a	List any four learning tasks. Explain unconstrained optimization techniques which employs steepest descent.	08
	b	Explain the working of the perception convergence algorithm.	08
		OR	
4	a	Discuss statistical learning theory with respect to supervised learning.	08
	b	With respect to working of a memory discuss the following i) Function of memory, ii) Derivation of memory matrix M, iii) Memory recall.	08

5	a	Derive an expression for back propagation algorithm, when neuron j is an output neuron, and also write control flow diagram.	08
	b	Explain the following: i) Cross-validation and generalization. ii) Sequential and Batch modes of training.	08
		OR	
6	a	With a neat diagram explain how XOR problem is solved using a single hidden layer with two neurons.	08
	b	Discuss stopping criteria of back propagation algorithm.	04
	c	Write a note on implementation of M-way classifier using MLP.	04
7	a	What is a Convolutional Neural Network? What are the three important ideas that can improve machine learning system performance, explain.	08
	b	With a block diagram explain working of a typical Convolutional Neural Network.	08
8	a	Illustrate by considering suitable example, the need for probabilistic models in deep learning.	08
	b	By considering sample graphs, discuss the process of graph conversion from directed to undirected and vice versa.	08