



Model Question Paper

Seventh Semester BE Degree Examination

Deep Learning

Time: 3 Hours (180 Minutes)

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.

2. M: Marks, L: RBT (Revised Bloom's Taxonomy) level, C: Course outcomes.

Module -1			M	L	C
Q1	a.	With a neat labeled diagram of a single-layer neural network, explain the operation of Softmax Regression for multiclass classification using suitable mathematical notation.	7	L2	CO1
	b.	Explain Cross-Entropy Loss in the context of binary and multiclass classification.	6	L2	CO1
	c.	Write a Python program to implement Softmax Regression from scratch using the Fashion-MNIST dataset for multiclass classification.	7	L3	CO4
OR					
Q2	a.	Explain the Multilayer Perceptron (MLP) architecture and describe the role of hidden layers and activation functions.	7	L2	CO1
	b.	Explain Weight Decay and Dropout and discuss how they help to reduce overfitting in multilayer neural networks	6	L2	CO1
	c.	Write a Python program to implement a Multilayer Perceptron using a high-level API for image classification on the Fashion-MNIST dataset.	7	L3	CO4
Module- 2					
Q3	a.	Explain the different layers in CNN models and their functions with a neat diagram.	6	L2	CO2
	b.	Write the block diagram of architecture of Alexnet and give the significance of each block of the model.	7	L2	CO2
	c.	Write a python code to implement LeNet Model by applying batch normalization after the convolution layers or fully connected layers but before the corresponding activation functions.	7	L3	CO4
OR					
Q4	a.	Explain the important features of AlexNet that contributed to its improved performance in image classification.	6	L2	CO2
	b.	Write the block diagram of architecture of VGG model and give the significance of each block of the model.	7	L2	CO2
	c.	Write a python code to implement a batch normalization layer with tensors from scratch. Use the proper comments to describe its functionality.	7	L3	CO4
Module – 3					
Q5	a.	Write a Python code to initialize RNN model parameter and to build the RNN model and show the computation of the RNN with hidden state using diagrams and equations.	7	L3	CO4
	b.	Illustrate the operations of calculation Input Gates, Forget Gates, and Output Gates of LSTM with relevant diagrams and equations.	6	L2	CO2

23AIPC402/23CIPC402

	c.	Illustrate the operation of bidirectional recurrent neural network with necessary equations and the block diagram of its architecture. Discuss about computation cost and applications	7	L2	CO2
OR					
Q6	a.	Write a Python code to initialize GRU model parameter and to build GRU model, show the hidden state computation of a GRU with relevant diagrams and equations.	7	L3	CO4
	b.	Describe the Architecture of a deep recurrent neural network and its significances.	6	L2	CO2
	c.	Illustrate the operations of attention mechanism with necessary equations and diagrams	7	L2	CO2
Module - 4					
Q7	a.	With a neat diagram, explain the components of Generative Adversarial Networks.	7	L2	CO3
	b.	Write Python code to implement RMSprop from scratch and write its mathematical model.	6	L3	CO4
	c.	Illustrate the operation of Generative Adversarial Networks with necessary block diagram and necessary equations	7	L2	CO4
OR					
Q8	a.	Illustrate how GAN can be used to generate photorealistic images.	7	L2	CO3
	b.	Write a Python code to implement generator and discriminator of Generative Adversarial Networks	6	L3	CO4
	c.	Give significances of Optimization Challenges like a) Local Minima b) Saddle points c) Vanishing Gradients with necessary equations and diagrams	7	L2	CO4
Module - 5					
Q9	a.	Discuss the steps to implement transfer learning and fine tuning for any job using standard pre trained model.	6	L2	CO3
	b.	Explain Single Shot Multi box Detection with block diagram.	7	L2	CO3
	c.	Discuss FCN for Semantic Segmentation in detail.	7	L2	CO3
OR					
Q10	a.	Discuss various augmentation techniques like cropping, flipping and coloring on any image.	6	L2	CO3
	b.	Explain Style Loss, Total Variance Loss, Loss function for style transfer.	7	L2	CO3
	c.	Illustrate the computation steps of Region based CNN with neat block diagram.	7	L2	CO3
