

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 labelled 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.	Discuss the steps involved in implementing Softmax Regression from scratch, including the classification dataset, model, loss function, optimization and prediction.	7	L2	CO1
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.	Discuss the implementation of Multilayer Perceptron using a high-level API with suitable steps.	7	L2	CO1
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	6	L2	CO2

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		Gates of LSTM with relevant diagrams and equations.			
	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
