Register Number:……..

KUMARAGURU
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B.E DEGREE EXAMINATIONS: NOV/DEC 2022

(Regulation 2018)

Seventh Semester

INFORMATION SCIENCE AND ENGINEERING

U18ISE0008: Deep Learning

COURSE OUTCOMES

CO1: Understand the major technology trends driving Deep Learning
CO2: Build, train and apply fully connected deep neural networks
CO3: Effectively use the common neural network techniques
CO4: Appropriately pick hyper parameters

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	Write the cost function of Logistic regression	CO1	[K_1]
2.	Summarize the drawbacks of Deep Learning.	CO1	[K_1]
3.	Which part of the biological neuron that is responsible for receiving signal from other neurons	CO2	[K_1]
4.	Why do we need non-linear activation function?	CO2	[K_1]
5.	List out the need for regularization.	CO2	[K_1]
6.	Show the condition for convergence of a perceptron learning algorithm.	CO3	[K_2]
7.	Assume you have four inputs to a Feed Forward neural network, the first hidden layer also has four neurons, and there are three output classes, what is the dimension of the weight matrix, W_1 between the input layer and the first hidden layer, given that there is only one hidden layer?	CO3	[K_4]
8.	Define Local Optima.	CO3	[K_1]
9.	Define hyperparameters. List out some of the hyper parameters of Deep Neural Network.	CO4	[K_1]
10.	Recall the importance of hyper parameter tuning.	CO4	[K_2]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	Why can a single layer of perceptron not be used to solve linear inseparable problems? Explain it with an example.	8	CO1	[K_1]
	b)	Solve the derivatives with a computation graph for the given equation. J(a,b,c) = 3(a+bc) where a=7, b=3 and c = 1.	8	CO1	[K_3]

12.	a)	Summarize the various activation functions and their derivatives and explain how you would choose one.	8	CO2	[K_2]
	b)	Demonstrate the vectorized implementation of one hidden layer Neural Network	8	CO2	[K_2]
13.	a)	Compare and contrast the characteristics of deep neural networks with human brain.	8	CO2	[K_2]
	b)	Evaluate the equation for Forward Propagation for a deep neural network.	8	CO2	[K_3]
14.	a)	Outline random initialization of weight vectors. What happens if you initialize weights to zero?	8	CO3	[K_2]
	b)	Describe the key components needed to implement a deep neural network.	8	CO3	[K_1]
15.	a)	Define Optimization and write about the Mini-batch gradient descent algorithm.	8	CO4	[K_2]
	b)	Summarize the preferred values for Bias and Variance to yield a low Mean Squared Error and explain the trade-off between Bias and Variance of a deep network.	8	CO4	[K_2]
16.	a)	Demonstrate the process of fitting Batch Norm into a neural network.	8	CO4	[K_2]
	b)	Explain with an example the procedure for training a SOFTMAX classifier.	8	CO4	[K_1]

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