

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2024

B.Tech-VII Semester (CSE/IT/ECE)

COURSE CODE (CREDITS): 19B1WCI738(3)

MAX. MARKS: 35

COURSE NAME: Introduction to Deep Learning.

COURSE INSTRUCTORS: VKS, KLK

MAX. TIME: 2 Hours

*Note: (a) All questions are compulsory.*

*(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems*

Q.No	Question	CO	Marks
Q1:	A convolution operation is performed over an input gray scale image of size 3 x 3 (represented as matrix X) with a filter of size 2 x 2 representing its weight matrix w1 and bias b1 that results in the next layer feature map z1 . Then after the ReLU, Maxpooling and flatten the 1-Dimensional flatten vector is fed to a single perceptron. At last the sigmoid activation function is applied to make a binary classification and the loss (L) is computed as the binary cross entropy. Assume that during the back propagation the derivative of loss with respect to z1 is known or already computed. Write a mini-batch back propagation gradient descent solution to update the w1 and b1 trainable parameters in the above CNN architecture.	CO3	[4+3]
Q2:	Describe the architecture of LSTM with a neat and clean diagram. Discuss the significance of all the gates used along with mathematical equations. Does the LSTM solve the issue of poor long-term memory in RNNs?	CO3	[3+3+1]
Q3:	Describe the architecture and loss function with and without regularization for an autoencoder when input is binary values.	CO4	[3+2+2]
Q4:	Describe architecture of GAN in terms of adversarial learning. Give its loss function, training process and applications in real life.	CO5	[3+2+2]
Q5:	Describe the various possible architectures for input and output combinations of an RNN for nonsequence and sequence types. Discuss sequence to sequence models for same length and different length input and outputs. Give applications of each architecture.	CO5	[7]