

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION-2022

B.Tech-VII Semester (CSE&IT)

COURSE CODE (CREDITS): 19B1WCI738 (3)

MAX. MARKS: 35

COURSE NAME: INTRODUCTION TO DEEP LEARNING

COURSE INSTRUCTORS: Jagpreet Sidhu

MAX. TIME: 2 Hours

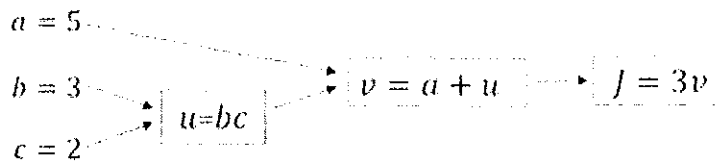
Note: All questions are compulsory. Marks are indicated against each question in square brackets.

- Q. No. 1 (a) Explain in brief the concept of vanishing/exploding gradient in training of deep neural network. [3,2 Marks] [CO-3]
- (b) How data augmentation increases the data size? What kind of augmentation can be done on any image file?
- Q. No. 2 (a) Suppose you have 5 convolutional kernel of size 7×7 with zero padding and stride 1 in the first layer of a convolutional neural network. You pass an input of dimension $224 \times 224 \times 3$ through this layer. What are the dimensions of the data which the next layer will receive? [2,3 Marks] [CO-3,2]
- (b) In terms of Hyper parameter Tuning and Optimization, answer the following:
- (i) What are the different hyper parameters of an Adam Optimizer? Write their default values if any.
- (ii) What is batch normalization? How does it help in handling the vanishing gradient problem?
- (iii) Name any five hyper parameters in terms of an artificial neural network. Give a suitable example.
- Q. No. 3 In terms of Recurrent Neural Networks, answer the following: [2, 3 Marks] [CO-4]
- (a) Name different types of RNN models with an example of each.
- (b) Discuss how you would train the recurrent neural network for sentiment classification on Amazon product reviews.
- Q. No. 4 Let's assume the following sequence of a CNN network [5 Marks] [CO-5]
- i. Input image is colored image with dimensions of 39×39 .
- ii. Ten 3×3 Convolution filters are applied with stride as 1 and padding as 0.
- iii. Twenty 5×5 Convolution filters are applied with stride as 2 and padding as 0.
- iv. Forty 7×7 Convolution filters are applied with stride as 2 and padding as 0.
- v. A fully connected layer by flattening the output of previous layer.

vi. Final layer of single neuron with SoftMax function.

Draw the complete CNN diagram for the above said network. Also label the size of each layer in the drawn network.

- Q. No. 5 (a) What is transfer learning? Discuss 3 ways for its implementation. [2,3 Marks]
 (b) Compute the forward pass and backward pass of following computation graph? [CO-1]



- Q. No. 6 (a) What will happen if we initialize all the weights of neural network to
 i. Zero [3,2 Marks]
 ii. Random between Zero and One [CO-2]
 iii. One
 Discuss in brief the affect on any neural network.

(b) What is the drawback of Tanh activation function in comparison to ReLU activation function?

- Q. No. 7 (a) Perform vertical and horizontal edge detection using convolution operator [3,2 Marks]
 for following 6*6 grey scale image. [CO-3]

3	0	1	2	7	4
1	5	8	9	3	1
2	7	2	5	1	3
0	1	3	1	7	8
4	2	1	6	2	8
2	4	5	2	3	9

(b) Discuss valid and same convolution by taking an illustrative case study?