

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-2 EXAMINATIONS-2022

B. Tech-VII Semester (CSE&IT)

COURSE CODE (CREDITS): 19B1WCI738 (3)

MAX. MARKS: 25

COURSE NAME: INTRODUCTION TO DEEP LEARNING

COURSE INSTRUCTORS: Jagpreet Sidhu

MAX. TIME: 1 Hour and 30 Minutes

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

- Q. No. 1 (a) Perform vertical and horizontal edge detection using convolution operator for following 6*6 grey scale image. [3+2 Marks] [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?

- Q. No. 2 (a) What is transfer learning? Discuss 3 ways for its implementation. [2+3 Marks]
(b) AlexNet is known as the model which has changed the perception of the world in terms of deep learning. In terms of AlexNet, answer the following: [CO-1]
(i) What is the input size of the image for AlexNet?
(ii) How many convolution layers were used in it?
(iii) How many fully connected layers were used in it?
(iv) Which activation function was used in the last layer?
(v) How many GPUs were used in it?

- Q. No. 3 (a) Suppose you have 5 convolutional kernel of size 7 x 7 with zero padding and stride 1 in the first layer of a convolutional neural network. You pass an input of dimension 224 x 224 x 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 Hyperparameter Tuning and Optimization, answer the following:

- (i) What are the different hyperparameters 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 hyperparameters in terms of an artificial neural network. Give a suitable example.

- Q. No. 4 (a) How regularization removes the overfitting problem in deep neural network? [2+3 Marks]
- (b) Discuss Dropout Regularization for deep neural network taking an example neural network. [CO-4]
- Q. No. 5 Discuss following algorithms with relation to optimization of training neural network? [2+3 Marks]
- (a) Mini-Batch algorithm [CO-5]
 - (b) RMSProp optimization algorithm.