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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third Semester MCA (Two Year) Degree (R,S) Examination December 2024

Course Code: 20MCA283

Course Name: DEEP LEARNING

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1	Describe the basic model of Artificial Neural Network.	(3)
2	Why Sigmoid or Tanh is not preferred to be used as activation function in the hidden layers of the neural network?	(3)
3	What are tensors in tensorflow? Explain different types of tensors available in tensorflow.	(3)
4	Explain the bias-variance trade off and mention its importance in learning.	(3)
5	An input image has been converted into a matrix of size 12X12 along with a filter of size 3X3 with a stride of 1. Determine the size of the convoluted matrix.	(3)
6	Why Convolutional Neural Networks are better than Artificial Neural Networks for image classification?	(3)
7	Explain different types of RNN. Give examples for each.	(3)
8	Distinguish between GRU and LSTM.	(3)
9	Mention any 3 applications of autoencoders.	(3)
10	What is upsampling in the context of GANs?	(3)

PART B

Answer any one question from each module. Each question carries 6 marks.

Module I

11	What is a perceptron and how it works? Design a perceptron neural network for OR gate implementation.	(6)

OR

12 Explain the significance of gradient descent in Artificial Neural Network. Compare different types of gradient descent techniques. (6)

Module II

13 Explain the role of batch normalization technique in neural networks. (6)

OR

14 What is overfitting? Explain different techniques used to reduce overfitting. (6)

Module III

15 (a) Perform the convolution operation on the following 6*6 input image with stride=1 by the 3*3 filter. (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

1	0	-1
1	0	-1
1	0	-1

(b) Explain the significance of ReLU activation function in the Convolutional Neural Network. (3)

OR

16 Describe the AlexNet architecture. (6)

Module IV

17 Describe the architecture of RNN. List out its applications and drawbacks. (6)

OR

18 Explain the working of LSTM. How does an LSTM cell address the vanishing gradient problem. (6)

Module V

19 Explain the architecture of autoencoders with a neat diagram. How does a variational autoencoder differ from an autoencoder. (6)

OR

20 How GANs can be trained? Explain the challenges encountered in training of GANs. (6)

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