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0520MCA283122201

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third Semester MCA (Two Years) Degree (R, S) Examination December/January 2023-24

Course Code: 20MCA283

Course Name: DEEP LEARNING

Max. Marks: 60

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

Marks

- 1 ✓ Explain MP Model with a suitable example. (3)
- 2 ✓ Explain a simple feed forward neural network with diagram. (3)
- 3 Discuss the importance of drop out layer in neural network. (3)
- 4 ✓ Consider the code snippet below to define a constant tensor in TensorFlow, (3)
What is the rank, shape and data type of this tensor?

```
sample_tensor = tf.constant([  
    [[0, 1, 2, 3, 4],  
     [5, 6, 7, 8, 9]],  
    [[10, 11, 12, 13, 14],  
     [15, 16, 17, 18, 19]],  
    [[20, 21, 22, 23, 24],  
     [25, 26, 27, 28, 29]],])
```
- 5 ✓ Which are the different types of layers present in Convolutional Neural Networks (CNN)? What is the purpose of each of these? (3)
- 6 Differentiate between *same* convolution and *valid* convolution (3)
- 7 ✓ Why a normal feed forward neural network cannot be used for text auto completion task? Which type of neural networks are more suitable for this purpose? (3)
- 8 ✓ Compare LSTM and GRU. ✓ ✓ ✓ ✓ (3)
- 9 ✓ Draw a block diagram for auto encoder. (3)
- 10 ✓ Explain the loss function in GAN (Generative Adversarial Network). (3)

1, 1, 3, 6, 1, 1, 1, 1, 1, 1

PART B

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

Module I

- 11 Explain perceptron model for learning XOR. (6)

OR

- 12 Explain the concept of back propagation in neural networks. (6)

Module II

- 13 With the help of code snippets in TensorFlow, show various steps by which a neural network can be trained. (6)

OR

- 14 a Show a method by which over fitting problem in neural networks can be solved? (3)
b Demonstrate the use of tSNE. (3)

Module III

- 15 a Perform convolution to get a feature map of size 3×3 (3)

Input	3	3	2	1	0
	0	0	1	3	1
	3	1	2	2	3
	2	0	0	2	2
	2	0	0	3	3

Filter	0	1	2
	2	2	0
	0	1	2

- b Illustrate max pooling on the following input by a 2×2 kernel with stride 2 (3)

8	3	5	9	4	2
4	7	2	4	5	8
6	5	2	1	3	10
1	7	3	6	2	1
2	4	1	3	5	2
7	3	2	8	6	9

OR

- 16 Illustrate working of AlexNet architecture. (6)

Module IV

- 17 a What are the main difficulties in training a RNN? How these can be solved? (3)
b Provide equations to define LSTM cell. Explain them. (3)

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- 18 — Illustrate how back propagation in RNN is different from that of feed forward neural network? (6)

Module V

- ✓ 19 What do you understand by Generator and Discriminator in GAN? How they are trained? (6)

OR

- 20 Explain Variational Auto Encoders with the help of diagram. (6)

1, 2, 3, 4, 5