CBCS SCHEME

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18AI81

Eighth Semester B.E. Degree Examination, June/July 2023
Neural Networks and Deep Learning

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. With code snippet explain gradient descent method using Tensor Flow. **(10 Marks)**

b. With respect to perceptron, explain the following with a neat diagram:
i) Linear threshold unit ii) Perceptron Learning rule. **(10 Marks)**

OR

2 a. With an example, explain logical computation with neurons and illustrate how ANNs performs simple logical computation. **(10 Marks)**

b. With respect to training a DNN using plain Tensor Flow explain construction phase and execution phase. **(10 Marks)**

Module-2

3 a. Describe Batch Normalization algorithm and explain its advantages. **(10 Marks)**

b. Compare and contrast the features of RMS prop algorithm with ADAM algorithm. **(10 Marks)**

OR

4 a. Explain the techniques required to avoid overfitting through regularization. **(10 Marks)**

b. Write a note on :
i) Reusing Pretrained Layers
ii) Freezing Lower Layers
iii) Catching the frozen layers. **(10 Marks)**

Module-3

5 a. Write a note on:
i) Sharding variables across multiple parameter server
ii) Sharing state across sessions using resource container. **(10 Marks)**

b. Define data parallelism and briefly explain Synchronous updates, Asynchronous updates and Bandwidth saturation. **(10 Marks)**

OR

6 a. Compare and contrast Alex Net architecture versus LeNet-5 architecture. **(10 Marks)**

b. Explain fully convolutional network and discuss how can you convert a dense layer into a convolutional layer. **(10 Marks)**

Module-4

7 a. With a diagram and example, explain the following :
i) Memory cell
ii) Input/Output sequences in RNN
iii) Peephole connections **(10 Marks)**

b. Describe the process of combining a convolution neural network with RNN to classify the videos. **(10 Marks)**

OR

8 a. What are the advantages of building a RNN using dynamic-rnn( ) method rather than static-rnn method. **(10 Marks)**

b. Discuss the techniques required to distribute training and execution of a deep RNN across multiple GPUs. **(10 Marks)**

Module-5

9 a. With code snippet and diagram explain variational autoencoders required for generating Fashion MNIST images. **(10 Marks)**

b. What is OpenAI Gym? Explain the working of cartpole environment using OpenAI Gym. **(10 Marks)**

OR

10 a. Explain Reinforcement learning? Determine the features of reinforcement learning by comparing with regular supervised and unsupervised learning. **(10 Marks)**

b. Using evaluation action of Reinforcement learning, propose a solution for credit assignment problem and justify how can you improve the rewards assigned. **(10 Marks)**

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