Register No.: .... Name: ....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SIXTH SEMESTER B.TECH DEGREE EXAMINATION (R), MAY 2024

(2020 SCHEME)

Course Code: 20CST384

Course Name: Concepts in Deep Learning

Max. Marks: 100 Duration: 3 Hours

PART A

(Answer all questions. Each question carries 3 marks)

1. Compare Deep Learning with Machine learning.
2. Can Principal Component Analysis be viewed as unsupervised learning algorithm? Examine.
3. Define ReLU.
4. State the need of Softmax activation function.
5. List out various data types that can be used with convolutional networks.
6. Create a chart that demonstrates convolution with a stride.
7. Draw a block diagram for LSTM.
8. Classify the important design patterns for recurrent neural networks.
9. What is an autoencoder? Give one application of an autoencoder.
10. Mention the trade-off faced in representation learning problems

PART B

(Answer one full question from each module, each question carries 14marks)

MODULE I

11. a) How does bias and variance tradeoff affect Machine Learning algorithms? (4)

    b) Describe how different parts of an Artificial Intelligence system relate to each other within different AI disciplines in detail with diagram. (10)
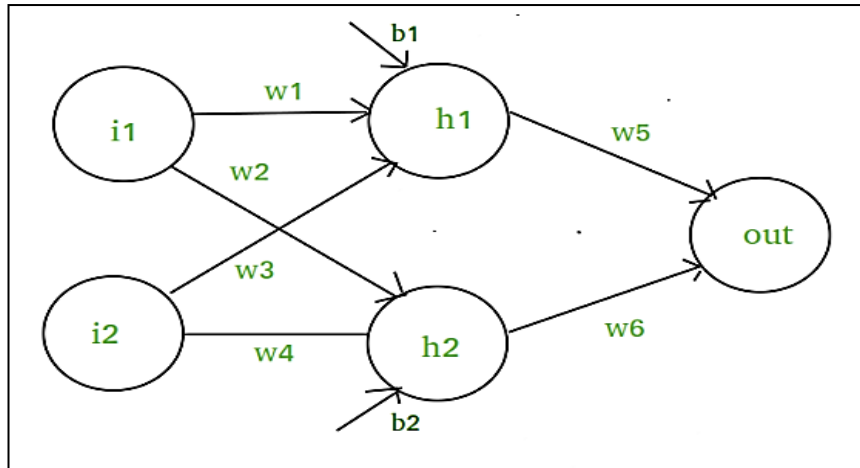
OR

12. Demonstrate the Concepts of Unsupervised Learning Algorithms using a Suitable example (14)

MODULE II

13. a) Develop Chain Rule of Calculus.   (10)

    b) Describe about learning conditional statistics in gradient based learning.   (4)

OR

14. a) Consider the back propagation neural network given below

where input layer i1=0.02, i2= 0.6 and the corresponding weights are given as w1=0.3, w2=0.20, w3= 0.30, w4= 0.20, w5= 0.3 w6=0.40. The expected output is 0.95. Infer the following using sigmoid activation function,

- Calculate the total error.

- Calculate the weight adjustment for the line w5.   (7)

    b) Discuss the characteristics of Back Propagation Algorithm.   (7)

MODULE III

15. a) Construct a convolutional network to demonstrate the effect of zero padding on network size.   (7)

    b) Explain Neuro scientific basis for Convolutional Networks.   (7)

OR

16. a) Illustrate unshared convolution with suitable examples.   (10)

    b) Explain Pooling with downsampling.   (4)

MODULE IV

17. Illustrate Encoder-Decoder sequence-to-sequence Architecture.   (14)

OR

18. Explain how to compute the gradient in a Recurrent Neural Network.   (14)

MODULE V

19. a) Explain about natural language processing with a suitable example. (7)

    b) Discuss speech recognition in detail. (7)

OR

20. Describe the following.
    i. Representation Learning. (7)
    ii. Deep Belief Networks. (7)

(14)

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