b. What is a computational graph? Explain a more complex unfolded computational graph with diagram. **7M**

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Reg. No: | | | | | | | | | | |

VELAGAPUDI RAMAKRISHNA

SIDDHARTHA ENGINEERING COLLEGE

(AUTONOMOUS)

IV/IV B.Tech. DEGREE EXAMINATION, MARCH, 2021

Seventh Semester

INFORMATION TECHNOLOGY

17IT4703A DEEP LEARNING

Time: 3hours ***Max. Marks: 70***

Part-A is compulsory

Answer One Question from each Unit of Part-B

Answer to any single question or its part shall be written at one place only

PART-A

10 x 1 = 10M

1. a. List the types of layers in CNN.
   b. What is the difference between deep and shallow network?
   c. What is word embedding?
   d. How to represent filters and feature maps as neurons in a convolutional layer?
   e. Write the function of denoising autoencoder.
   f. What is sparsity in autoencoders?
   g. Define computational graph.
   h. Write short notes on bidirectional RNNs.
   i. What is overfitting in deep neural networks?
   j. Write the difference between feed forward network and recurrent network.

PART-B

4 x 15 = 60M

UNIT-I

2. a. Derive the backpropagation rule considering the training rule for output unit weights and training rule for hidden unit weights. **8M**

   b. Write the functional description of a biological neuron's structure with a suitable diagram. **7M**

(or)

3. a. What is gradient descent? Explain the following three variants of gradient descent: **9M**

   i) Batch

   ii) Stochastic

   iii) Mini-batch

   b. List and explain various activation functions. **6M**

UNIT–II

4. a. Draw and explain the architecture of convolutional network. **7M**

   b. How batch normalization can be expressed for a convolutional layer? Express in TensorFlow. **8M**

(or)

5. a. Discuss about short comings of feature selection. **8M**

   b. Write the architectural description of VGGNet, a deep convolutional network built for ImageNet. **7M**

UNIT–III

6. a. What is Principle Component Analysis algorithm? Write the applications of it. **8M**

   b. Why would we use autoencoders? Differentiate between autoencoders vs. PCA. **7M**

(or)

7. a. What is Word2Vec and what it does? How the activation layer is computed in the word embedding? **8M**

   b. Elaborate a situation in which PCA fails to optimally transform the data for dimensionality reduction? **7M**

UNIT–IV

8. a. Why do you consider recurrent neural network? Also, explain what problems are normal CNNs good at? **8M**

   b. Explain the basic schema of an echo state network with a tuneable frequency generator task. **7M**

(or)

9. a. Explain gated recurrent neural networks. How are gated RNNs better than RNNs? **8M**