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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CSE) (Sem.-7,8)

**DEEP LEARNING**

Subject Code : BTCS-704-18

M.Code : 90495

Date of Examination : 12-12-2023

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

**1) Write briefly :**

- a) What is overfitting?
- b) Which models have high bias?
- c) What is regularization?
- d) What do you mean by training loss?
- e) What is optimization?
- f) What is directed generative net?
- g) What are auto-encoders?
- h) Explain the applications of sequence-to-sequence architectures.
- i) Explain the role of sigmoid belief networks.
- j) What is bagging?

## SECTION-B

- 2) Differentiate between supervised and unsupervised learning.
- 3) Differentiate between batch gradient descent and stochastic gradient descent algorithms
- 4) Describe the relationship between bias and variance in the context of machine learning models. How does this relationship influence model performance?
- 5) Consider a 2D convolutional layer with a kernel size of  $3 \times 3$ , a stride of 2, and no padding. If the input image is  $28 \times 28$  with a single channel, calculate the dimensions of the output feature map.
- 6) What is the difference between Boltzmann machine and neural network? Elaborate in detail.

## SECTION-C

- 7) Explain the concept of Bidirectional Recurrent Neural Networks (RNNs) in the context of sequence modeling. Discuss the advantages of using Bidirectional RNNs over traditional (unidirectional) RNNs.
- 8) What is Convolutional Neural Network (CNN)? Explain the following with the help of an example :
  - a) Convolution operation
  - b) Types of Pooling layer
- 9) Answer the following :
  - a) What is dropout? Why it is used?
  - b) What is data augmentation? Explain its role in CNN.
  - c) List and explain various optimization algorithms used in deep learning.
  - d) Explain the importance of back-propagation.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**