Guru Tegh Bahadur Institute of Technology, New Delhi

Course Name: B.Tech (AIML) **Semester: 5th** **SUB CODE: AIML 305**

Subject: FODL

Assignment: 1

Q1. Explain the concept of Bayesian learning in detail.

Q2. Explain the importance of linear classifiers depicting several linear classifiers.

Q3. Explain the concept of Shallow learning in detail

Q4. Differentiate between the following:

a) Single layer neural network and Multilayer neural network (MLP)
b) Shallow learning and Deep Learning
c) Machine Learning and Deep Learning

Q5. Why optimizers are important in Deep learning? Explain different types of optimizers.

Q6. What is the significance of Adding momentum in Gradient Descent optimization? Explain in detail.

Assignment: 2

Q1. Differentiate between a Biological neuron and Artificial neuron.

Q2. Explain the process of backpropagation in ANN with the help of an example.

Q3. Differentiate between Single layer perceptron and Multilayer Perceptron

Q4. Explain different loss function in deep learning along with their applications, advantages and disadvantages.

Q5. Explain the problem of vanishing gradient descent and exploding gradient descent in deep learning.

Q6. Construct a single layer neural network for implementing OR, AND, NOT gates.

Assignment: 3

Q1. Why activation functions are important in deep learning? Explain different activation functions in deep learning along with their applicability according to the application.

Q2. What is sequential model. What are different sequential models in deep learning?

Q3. Describe the various steps involved in text generation using LSTM?

Q4. What is sequential or time series data. Explain various applications which involves time series data?

Q5. Explain the concept of hyperparameters in context of deep learning. Enlist various model parameters and hyperparameters in deep learning. Why hyperparameter tuning is required? Illustrate with the help of a use case.

Q6. Describe the architecture of Gated Recurrent Unit.

Assignment: 4

Q1. Explain the architecture of CNN with various building blocks of CNN.

Q2. Explain VGG16net Architecture, with diagram and trainable params.

Q3 Explain the advantages of transfer learning.

Q4. Implement and train a Convolutional neural network (CNN) on a hand-written digits image dataset called MNIST and improve model generalization by achieving increased accuracy and decreased loss where model gains good confidence with the prediction.

Q5. List the deep learning applications in Computer Vision. Derive your own use case which has scope in fulfilling societal needs.

Q6. Relate the contributions of deep learning in Natural Language Processing (NLP). Investigate the possible use cases with its usage towards society.

Q7. Summarize the applications of deep learning in healthcare. Identify a novel use case and discuss its scope.