Printed Page:- 04 **Subject Code**:- **AEC0613**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VI - THEORY EXAMINATION (2023 - 2024)

Subject: ANN & Deep Learning

Time: 3 Hours **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* **three Sections -A, B, & C.** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION A **20**

1. Attempt all parts:-

1-a. What is unsupervised learning? (CO1) 1

(a) weight adjustment based on deviation of desired output from actual output

(b) weight adjustment based on desired output only

(c) weight adjustment based on local information available to weights

(d) none of the mentioned

1-b. What's the main point of difference between human & machine intelligence? (CO1) 1

(a) human perceive everything as a pattern while machine perceive it merely as data

(b) human have emotions

(c) human have more IQ & intellect

(d) human have sense organs

1-c. What is the goal of Gradient Descent? (CO2) 1

(a) To maximize the objective function

(b) To minimize the objective function

(c) To improve the accuracy of the model

(d) o reduce the number of parameters in the model

1-d. What is the advantage of using Momentum-based Gradient Descent? (CO2) 1

(a) It converges faster than Gradient Descent

(b) It avoids overfitting

(c) It is less prone to local minima

(d) It guarantees global minimum

1-e. Early Stopping refers to- (CO3) 1

(a) A technique for reducing bias in machine learning models

(b) A technique for reducing variance in machine learning models

(c) A technique for reducing overfitting in machine learning models

(d) A technique for reducing underfitting in machine learning models

1-f. What is the impact of increasing model complexity on the bias-variance tradeoff? (CO3) 1

(a) It increases bias and decreases variance

(b) It increases variance and decreases bias

(c) It increases both bias and variance

(d) It decreases both bias and variance

1-g. Which of the following is a subset of machine learning? (CO4) 1

(a) Numpy

(b) SciPy

(c) Deep Learning

(d) none of the above

1-h. CNN is mostly used when there is an- (CO4) 1

(a) Structured data

(b) unstructured data

(c) both A & B

(d) none of the above

1-i. What does LSTM stand for? (CO5) 1

(a) Long Short-Term Memory

(b) Linear Short-Term Memory

(c) Large-Scale Temporal Memory

(d) Low-Level Sequential Memory

1-j. Which activation functions are commonly used in LSTM networks? (CO5) 1

(a) Sigmoid and ReLU

(b) Sigmoid and Tanh

(c) Tanh and ReLU

(d) Softmax and Tanh

2. Attempt all parts:-

2.a. Define Supervised learning. (CO1) 2

2.b. Define learning rate in Gradient Descent. (CO2) 2

2.c. Elaborate variance with suitable diagram. (CO3) 2

2.d. Explain the operation of maxpooling in CNN. (CO4) 2

2.e. How does the input gate work in an LSTM cell? (CO5) 2

SECTION B **30**

3. Answer any <u>five</u> of the following:-

3-a. Discuss Reinforcement learning in detail. (CO1) 6

3-b. Implement OR function using ANN? (CO1) 6

3-c. What are the advantages and disadvantages of gradient descent? (CO2) 6

3-d. Write the short note on gradient descent. (CO2) 6

3.e. Discuss the importance of softmax in CNN. (CO3) 6

3.f. Briefly explain the two major steps of CNN i.e, Feature Learning and Classification. (CO4) 6

3.g. Write the short note on encoder decoder model. (CO5) 6

SECTION C **50**

4. Answer any <u>one</u> of the following:-

4-a. Calculate the N/W output for x1=0.3, x2=0.4, bias b=1 with weight of 0.3 for bipolar activation function. Assume w1=w2=1. (CO1) 10

4-b. Draw and explain the Multilayer ANN model through an appropriate example. (CO1) 10

5. Answer any <u>one</u> of the following:-

5-a. Describe gradient descent with figure and also write its advantage and disadvantage. (CO2) 10

5-b. Write the short note on gradient descent and stochastic gradient descent .(CO2) 10

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6. Answer any <u>one</u> of the following:-

6-a.	Write short note on the following: (i) Preprocessing of data set, (ii) vector representation of words (CO3)	10
6-b.	Explain the terms (i) bias and variance, (ii) data augmentation (iii) Batch normalization (iv) Softmax Layer. (CO3)	10

7. Answer any <u>one</u> of the following:-

7-a.	Discuss the working of the DenseNet with suitable architecture. (CO4)	10
7-b.	Discuss the LeNet classifier model with its proper architecture? (CO4)	10

8. Answer any <u>one</u> of the following:-

8-a.	Describe in detail all the gates used in long short-term memory (LSTM) network. (CO5)	10
8-b.	Draw and explain the working of backpropagation through time (BPTT). (CO5)	10