Printed Page:- **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 (20.. - 20....)

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. A possible neuron specification to solve the AND problem requires a minimum of- (CO1,K1) 1

(a) Single Neuron

(b) Two Neuron

(c) Three neuron

(d) Four Neuron

1-b. Conventional Artificial Intelligence is different from soft computing in the sense. (CO1,K1) 1

(a) Conventional Artificial Intelligence deal with prdicate logic where as soft computing deal with fuzzy logic

(b) Conventional Artificial Intelligence methods are limited by symbols where as soft computing is based on empirical data

(c) Both (a) and (b)

(d) None of the above

1-c. What is the advantage of using Momentum-based Gradient Descent? (CO2,K1) 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-d. Principal components calculated in PCA.....(CO2,K1) 1

(a) By multiplying the original data matrix by its transpose

(b) By finding the eigenvectors and eigenvalues of the covariance matrix

(c) By calculating the mean of each variable in the dataset

(d) By using a clustering algorithm

1-e. Early Stopping refers to- (CO3,K1) 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 a Softmax layer?(CO3,K1) 1

(a) A layer in a neural network that performs nonlinear transformations on the input data

(b) A layer in a neural network that applies a regularizer to the weights

(c) A layer in a neural network that calculates the gradient of the cost function with respect to the weights

(d) A layer in a neural network that converts the output of the previous layer into a probability distribution

1-g. Which of the following is a subset of machine learning? (CO4,K1) 1

(a) Numpy

(b) SciPy

(c) Deep Learning

(d) none of the above

1-h. RNN stands for-(CO4,K1) 1

(a) Recurrent neural network

(b) recall network

(c) report NN

(d) None of the above

1-i. What does LSTM stand for? (CO5,K1) 1

(a) Long Short-Term Memory

(b) Linear Short-Term Memory

(c) Large-Scale Temporal Memory

(d) Low-Level Sequential Memory

1-j. Which of the following is NOT a key component of an LSTM network? (CO5,K1) 1

(a) Forget gate

(b) Input gate

(c) Memory gate

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(d) Output gate

2. Attempt all parts:-

2.a.	Define Supervised learning. (CO1,K1)	2
2.b.	Define learning rate in Gradient Descent. (CO2,K2)	2
2.c.	Discuss the role of batch normalization in deep learning? (CO3,K2)	2
2.d.	Explain the operation of maxpooling in CNN. (CO4,K2)	2
2.e.	What is the purpose of the activation functions in an LSTM network?(CO5,K2)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Explain the uses of ANN in real world applications. (CO1,K2)	6
3-b.	Discuss Reinforcement learning in detail. (CO1,k2)	6
3-c.	Explain the principal component analysis. (CO2,K2)	6
3-d.	Write the short note on stochastic gradient descent. (CO2,K2)	6
3.e.	Explain max pooling, average pooling and strides in CNN.(CO3,K2)	6
3.f.	Explain the CNN with the help of basic architecture.(CO4, K2)	6
3.g.	Write the difference between GRU and long short-term memory (LSTM) network. (CO5,K2)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Write short note on latest trends in AI technology. (CO1,K3)	10
4-b.	Explain the working of feedforward neural network with suitable diagram. (CO1,K2)	10

5. Answer any one of the following:-

5-a.	Describe gradient descent with figure and also write its advantage and disadvantage. (CO2,K2)	10
5-b.	How does PCA works and also discuss the purpose of performing PCA in machine learning. (CO2,K2)	10

6. Answer any one of the following:-

6-a.	Write short note on the following: (i) Regularization, (ii) Early stopping. (CO3,K2)	10
6-b.	Write short note on the following: (i) ReLU activation function, (ii) sigmoid function, (iii) tanh (iv) linear activation function (v) Leaky ReLU activation function. (CO3,K2)	10

7. Answer any one of the following:-

7-a.	Discuss the working of the DenseNet with suitable architecture. (CO4,K2)	10
7-b.	Explain the VGGNet classifier model with its proper architecture?(CO4,K2)	10

8. Answer any one of the following:-

8-a.	Describe in detail all the gates used in long short-term memory (LSTM) network. (CO5,K2)	10
8-b.	Draw and explain the working of RNN in detail. (CO5,K4)	10

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