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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VII - THEORY EXAMINATION (2025 - 2026)

Subject: 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. _____ refers to a model that can neither model the training data nor generalize to new data (CO1,K3) 1
- (a) Complex model, Overfit
- (b) Complex model, Underfit
- (c) Simple model, Underfit
- (d) Simple model, Overfit
- 1-b. Predicting the price of a house given its size an example of (CO1,K1) 1
- (a) supervised learning
- (b) Unstructured learning
- (c) remote learning
- (d) None ..
- 1-c. Deep learning algorithms are _____ more accurate than machine learning algorithms in image classification (CO2,K4) 1
- (a) 0.0037
- (b) 0.0041
- (c) 0.33
- (d) 0.004
- 1-d. Which of the following would have a constant input in each epoch of training a Deep Learning model? (CO2,K2) 1
- (a) Weight between input and hidden layer
- (b) Weight between hidden and output layer
- (c) Biases of all hidden layer neurons

- (d) Activation function of output layer
- 1-e. Functions that can be used as an activation function in the output layer if we wish to predict the probabilities of n classes (p_1, p_2, \dots, p_n) such that sum of p over all n equals to 1 is? (CO3,K3) 1
- (a) Softmax
 (b) ReLu
 (c) Sigmoid
 (d) Tanah
- 1-f. Among the following option identify the one which is not a type of learning. (CO3, K1) 1
- (a) Semi unsupervised learning
 (b) Supervised learning
 (c) Reinforcement learning
 (d) Unsupervised learning
- 1-g. In which type of neural network, the connection is feedforward, self connection or connections to the units in the previous layers (CO4,K4) 1
- (a) Radial Basis Functions Neural Network
 (b) Modular Neural Network
 (c) Convolution Neural Network
 (d) Recurrent Neural Network
- 1-h. The following is TRUE about Weight Initialization. (CO4,K2) 1
- (a) If weights are too high, it may lead to vanishing gradient
 (b) Model may never converge due to wrong weight initialization
 (c) If weights are too low, it may lead to exploding gradient
 (d) All of the above
- 1-i. De-noising and Contractive are examples of _____.(CO5,K3) 1
- (a) Shallow Neural Networks
 (b) Convolution Neural Networks
 (c) ANN
 (d) Recurrent Neural Networks
- 1-j. For document classification and summarization, it is important to look at the important sentences and important words. What kind of “attention” mechanism is required for encoding? (CO5,K2) 1
- (a) Hierarchical
 (b) Sequential
 (c) Non Sequential
 (d) Unordered

2. Attempt all parts:-

- 2.a. Are classification and clustering are same or different ,Justify (CO1,K2) 2
- 2.b. What happens when the value of stride is high and low (CO2,K2) 2
- 2.c. Define Recognition (CO3,K2) 2

2.d.	Give the difference between RNN and Feed Forward Network . (CO4,K2)	2
2.e.	Explain about Autoencoders Function.(CO5,K2)	2
SECTION-B		30
3. Attempt all parts:-		
3.a. Answer any <u>one</u> of the following:-		
3.a.(i)	Elaborate perception in deep learning (CO1,K1)	6
3.a.(ii)	Differentiate between R squared and adjusted R squared. (CO1,K2)	6
3.b. Answer any one of the following:-		
3.b.(i)	Explain fine-tuning in CNN with example.(CO2,K2)	6
3.b.(ii)	Describe the role of convolution layers in extracting patterns from images and explain how multiple layers improve feature representation.(CO2, K2)	6
3.c. Answer any one of the following:-		
3.c.(i)	Explain some line detection/ recognition algorithms used in deep learning.(CO3,K2)	6
3.c.(ii)	Differentiate between Inception and Inception v3 (CO3,K2)	6
3.d. Answer any one of the following:-		
3.d.(i)	Compare with the Unfolding Computational Graphs and Bidirectional RNNs . (CO4,K3)	6
3.d.(ii)	Describe Echo State Networks & Explain challenge of Long-Term Dependencies. (CO4, K2)	6
3.e. Answer any one of the following:-		
3.e.(i)	Describe the approach used in Denoising Autoencoders. (CO5,K3)	6
3.e.(ii)	Compare Variational Autoencoders and Generative Adversarial Networks. (CO5, K2)	6
SECTION-C		50
4. Answer any <u>one</u> of the following:-		
4-a.	Explain the following in details: (i) Auto associative memory storage algorithm (ii)Self organizing networks .(CO1,K2)	10
4-b.	Explain how a neural network can be trained using back propagation . derive the equation for weight modification in multi-layer feed forward model . (CO1,K4)	10
5. Answer any <u>one</u> of the following:-		
5-a.	Explain the use of the convolution layer in CNN with example (CO2,K4)	10
5-b.	Differentiate between Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN) and in which cases would use each one.(CO2,K2)	10
6. Answer any <u>one</u> of the following:-		
6-a.	Explain filtering, stride and padding in Convolutional Neural Network (CO3,K3)	10
6-b.	Explain A Single-Stage Object Detection Framework for Industrial Applications.(CO3,K3)	10
7. Answer any <u>one</u> of the following:-		
7-a.	Prepare an example of sequence model or sequence-to-sequence RNN architecture (CO4,K2)	10
7-b.	Explain and differentiate Long-Term Dependencies and Long Short-Term Memory	10

.(CO4,K2)

8. Answer any one of the following:-

- 8-a. Compare and contrast dropout and batch normalization in terms of their effects on model performance and convergence.(CO5, K2) 10
- 8-b. Compare autoencoders and GANs in terms of design and the type of output they produce.(CO5, K2) 10

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