

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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

B.Tech

SEM: VI - 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:-

- (1.1) GPU stands for- (CO1,K1) 1
- (a) graphics processors unit
 - (b) graphics parallel unit
 - (c) global processor unit
 - (d) None .
- (1.2) Backpropagation is a learning technique that adjusts weights in the neural network by propagating weight changes- (CO1,K2) 1
- (a) Backward from sink to source
 - (b) Forward from source to sink
 - (c) backward from sink to hidden nodes
 - (d) forward from source to hidden nodes
- (1.3) What is the advantage of using convolutional layers in a CNN? (CO2, K2) 1
- (a) They can capture local spatial patterns in the input data
 - (b) They can handle sequential data
 - (c) They can generate synthetic data
 - (d) They can handle variable-length inputs
- (1.4) Which of the following techniques perform similar operations as a dropout in a neural network?(CO2, K2) 1
- (a) Boosting
 - (b) Bagging
 - (c) Stacking
 - (d) None of the above

- (1.5) How does YOLO predict bounding boxes and class probabilities for objects in an image? (CO3,K2) 1
- (a) It divides the image into a grid and each grid cell predicts bounding boxes and class probabilities.
 - (b) It uses a sliding window approach with a fixed-size classifier.
 - (c) It generates region proposals first, then classifies and refines them.
 - (d) It classifies each pixel independently as belonging to an object or background.
- (1.6) Which technique is used to recognize and understand text in images or videos? (CO3,K1) 1
- (a) Motion detection
 - (b) Optical character recognition (OCR)
 - (c) Feature extraction
 - (d) Image stitching
- (1.7) Which layer type is typically used to capture sequential dependencies in an RNN? (CO4, K2) 1
- (a) Input Layer
 - (b) Output Layer
 - (c) Hidden Layer
 - (d) Activation Layer
- (1.8) Music Generation and Image Captioning are the examples of (CO4, K1) 1
- (a) One-to -one RNN
 - (b) One-to-Many RNN
 - (c) Many-to-One RNN
 - (d) Many-to-many RNN
- (1.9) De-noising and Contractive are examples of _____ (CO5, K1) 1
- (a) Autoencoder
 - (b) Convolution Neural Networks
 - (c) ANN
 - (d) Recurrent Neural Networks
- (1.10) Which of the following model contains internal memory? (CO5, K1) 1
- (a) Convolutional Neural Networks
 - (b) Capsule Neural Networks (CapsNets)
 - (c) ANN
 - (d) Autoencoder

2. Attempt all parts:-

- (2.1) Elaborate unstructured data.(CO1,K2) 2
- (2.2) Define computer vision. (CO2, K1) 2
- (2.3) Discuss the metrics used for object detection. (CO3, K2) 2
- (2.4) List some applications of Long Short Term Memory (LSTM) networks. (CO4, K1) 2
- (2.5) Explain about Bottleneck in autoencoder. (CO5,K2) 2

SECTION-B

30

Answer any one of the following:-

- (3.1) Outline various measures to determine the accuracy of a classification model. (CO1, K3)) 6
- (3.2) Explain datafication with various examples. (CO1, K2) 6

Answer any one of the following:-

- (3.3) Describe the typical steps involved in training a simple convolutional neural network for an image classification task. (CO2,K2) 6
- (3.4) How transfer learning is applied in deep learning? Explain with the help of an appropriate example . (CO2, K3) 6

Answer any one of the following:-

- (3.5) Explain various types of padding in deep learning. (CO3, K2) 6
- (3.6) Elaborate how edge detection is performed in the earlier layers of Convolutional Neural Networks(CNNs) along with edge properties. (CO3, K3) 6

Answer any one of the following:-

- (3.7) Explain different types of Recurrent Neural Networks along with their applications. (CO4,K2) 6
- (3.8) Describe Long Short-Term Memory. (CO4, K3) 6

Answer any one of the following:-

- (3.9) Describe the approach used in Denoising Autoencoders. (CO5, K2) 6
- (3.10) Analyse Variational Autoencoders in detail. (CO5, K5) 6

SECTION-C

50

4. Answer any one of the following:-

- (4.1) Differentiate between artificial and biological neurons in details. Also discuss various application of neural network. (CO1, K4) 10
- (4.2) Differentiate between Machine Learning and Deep Learning. (CO1, K4) 10

5. Answer any one of the following:-

- (5.1) Describe some of the tools to visualize neural network architectures. (CO2, K2) 10
- (5.2) You are comparing the performance of two CNN architectures for image classification. Describe some metrics you could use to evaluate their effectiveness. (CO2, K3) 10

6. Answer any one of the following:-

- (6.1) Explain the architecture of pre trained CNN Models. (CO3, K2) 10
- (6.2) Illustrate the operation of pooling layer in CNN with suitable example. (CO3, K3) 10

7. Answer any one of the following:-

- (7.1) Explain in following in details- i) Language model, ii)sequence Generation. (CO4, K2) 10
- (7.2) Draw and explain the architecture of deep RNN. (CO4, K4) 10

8. Answer any one of the following:-

- (8.1) Discuss Dimensionality Reduction in autoencoder. (CO5, K3) 10
- (8.2) Give a detailed overview on stacked autoencoder with example. (CO5, K3) 10