# Multiple Choice Questions for Lecture 6: Deep Learning and Computer Vision

## Basic Concepts Review

1. Which of the following best describes Artificial Intelligence?
   * 1. The ability of computers to perform calculations quickly
     2. The ability of computers to perform tasks that normally require human intelligence
     3. The ability of computers to connect to the internet
     4. The ability of computers to store large amounts of data

* Answer: B) The ability of computers to perform tasks that normally require human intelligence

1. What is machine learning?
   * 1. When computers learn from data without being explicitly programmed
     2. When computers follow exact instructions given by programmers
     3. When computers teach humans new skills
     4. When computers calculate mathematical equations

* Answer: A) When computers learn from data without being explicitly programmed

## Deep Learning Basics

1. What is deep learning?
   * 1. Learning that happens deep underwater
     2. Learning about deep space
     3. A branch of machine learning using neural networks with many layers
     4. Learning that takes a very long time

* Answer: C) A branch of machine learning using neural networks with many layers

1. What is a key difference between traditional machine learning and deep learning?
   * 1. Traditional machine learning is newer than deep learning
     2. Traditional machine learning often requires manual feature extraction; deep learning can discover features automatically
     3. Deep learning doesn’t use data; traditional machine learning does
     4. Traditional machine learning is only used for images; deep learning is used for text

* Answer: B) Traditional machine learning often requires manual feature extraction; deep learning can discover features automatically

1. What does the term “depth” refer to in deep learning?
   * 1. The difficulty of the problems it solves
     2. How deeply it understands concepts
     3. The number of layers in the neural network
     4. The depth of knowledge of the programmer

* Answer: C) The number of layers in the neural network

1. What is representation learning in the context of deep learning?
   * 1. Learning how to represent yourself in social situations
     2. The ability of a machine to automatically discover important features from raw data
     3. Learning how to draw representations of objects
     4. A way to represent problems in mathematical form

* Answer: B) The ability of a machine to automatically discover important features from raw data

## Neural Networks

1. What inspired the design of neural networks?
   * 1. Computer circuits
     2. The human brain
     3. Electrical grids
     4. Traffic networks

* Answer: B) The human brain

1. Which of these is NOT a type of neural network mentioned in the lecture?
   * 1. Convolutional Neural Networks (CNN)
     2. Recurrent Neural Networks (RNN)
     3. Diagonal Neural Networks (DNN)
     4. Feedforward Neural Networks (FNN)

* Answer: C) Diagonal Neural Networks (DNN)

1. What are the main parts of a standard neural network?
   * 1. Input layer, hidden layers, output layer
     2. Start, middle, end
     3. Top, bottom, sides
     4. Data, algorithm, result

* Answer: A) Input layer, hidden layers, output layer

1. What is a *perceptron*?
   * 1. A type of camera used in computer vision
     2. *A neural network without any hidden layers*
     3. A special type of deep learning algorithm
     4. The person who creates a neural network

* Answer: B) A neural network without any hidden layers

1. During which phase of neural network learning are the *weights* adjusted?
   * 1. The feedforward phase
     2. The backpropagation phase
     3. The input phase
     4. The testing phase

* Answer: B) The backpropagation phase

## Convolutional Neural Networks (CNNs)

1. What are Convolutional Neural Networks (CNNs) especially designed for?
   * 1. Text processing
     2. Audio processing
     3. Image processing
     4. Financial data

* Answer: C) Image processing

1. Which of these is NOT a main component of a CNN?
   * 1. Convolutional layer
     2. Pooling layer
     3. Fully connected layer
     4. Grammar layer

* Answer: D) Grammar layer

1. What is the purpose of pooling layers in a CNN?
   * 1. To add more features to the image
     2. To reduce image size while keeping important information
     3. To add color to black and white images
     4. To connect to other neural networks

* Answer: B) To reduce image size while keeping important information

1. What makes CNNs particularly efficient for image processing?
   * 1. They can process images faster than humans
     2. They use parameter sharing (same filter across the image)
     3. They can work with any size of image
     4. They don’t require any training

* Answer: B) They use parameter sharing (same filter across the image)

## Computer Vision

1. What is computer vision?
   * 1. A type of eyeglasses for computers
     2. Teaching computers to understand images and videos like humans do
     3. The ability of computers to predict the future
     4. A way for computers to improve their screen resolution

* Answer: B) Teaching computers to understand images and videos like humans do

1. What is the difference between *passive* and *active* sensing in computer vision?
   * 1. Passive sensing uses electricity; active sensing doesn’t
     2. Passive sensing captures existing light; active sensing sends out signals
     3. Passive sensing is old technology; active sensing is new
     4. Passive sensing is manual; active sensing is automatic

* Answer: B) Passive sensing captures existing light; active sensing sends out signals

1. How does a computer “see” an image of a cat compared to how humans see it?
   * 1. The computer sees a cute pet; humans see a grid of pixels
     2. The computer sees a grid of numbers; humans see a furry animal
     3. The computer sees in black and white; humans see in color
     4. Both see exactly the same thing

* Answer: B) The computer sees a grid of numbers; humans see a furry animal

1. Which of these is NOT a real-world application of computer vision mentioned in the lecture?
   * 1. OCR (converting handwritten text to digital)
     2. Face detection
     3. Weather prediction
     4. Self-driving cars

* Answer: C) Weather prediction

1. What are the two core ***problems*** in computer vision mentioned in the lecture?
   * 1. Recognition and detection
     2. **Rec**onstruction and **rec**ognition
     3. Resolution and color
     4. Brightness and contrast

* Answer: B) Reconstruction and recognition