



**COMPUTER AND INFORMATION DEPARTMENT**

**SDT 2143**

**ARTIFICIAL INTELLIGENCE  
IN MODERN COMPUTING**

**LAB ACTIVITY :  
INTRODUCTION TO NEURAL NETWORK**

### Multiple Choice Questions (20)

1. What is the basic unit of a neural network?
  - A. Neuron
  - B. Pixel
  - C. Layer
  - D. Weight
  
2. Which part of a neural network adjusts during training?
  - A. Input
  - B. Output
  - C. Weights
  - D. Activation
  
3. What does backpropagation primarily optimize?
  - A. Input data
  - B. Activation function
  - C. Loss function
  - D. Parameter values
  
4. Which function introduces non-linearity in neural networks?
  - A. Linear regression
  - B. Activation function
  - C. Cost function
  - D. Gradient descent

5. What is the role of the loss function?

- A. To store weights
- B. To calculate error
- C. To activate neurons
- D. To normalize data

6. Which algorithm is used to minimize the loss function?

- A. Decision tree
- B. K-means
- C. Gradient descent
- D. Random forest

7. What does a neural network mimic?

- A. Human heart
- B. Human brain
- C. Human lungs
- D. Human eye

8. Which layer receives the raw input data?

- A. Output layer
- B. Hidden layer
- C. Input layer
- D. Activation layer

9. What is the output of a neuron called?

- A. Signal
- B. Activation
- C. Gradient
- D. Bias

10. Which of the following is NOT a common activation function?

- A. ReLU
- B. Sigmoid
- C. Tanh
- D. Linear regression

11. What is the purpose of the hidden layer?

- A. To store data
- B. To perform computations
- C. To display results
- D. To collect feedback

12. What does the term “epoch” refer to in training?

- A. One complete pass through the dataset
- B. One neuron activation
- C. One layer computation
- D. One weight update

13. Which concept helps neural networks generalize better?

- A. Overfitting
- B. Underfitting
- C. Regularization
- D. Memorization

14. What is the derivative of the loss function used for?

- A. To increase error
- B. To update weights
- C. To normalize data
- D. To activate neurons

15. Which layer produces the final prediction?

- A. Input layer
- B. Hidden layer
- C. Output layer
- D. Activation layer

16. What does “feedforward” refer to?

- A. Sending data backward
- B. Updating weights
- C. Passing input through the network
- D. Calculating gradients

17. What is the main drawback of deep networks?

- A. Too few parameters
- B. High interpretability
- C. Overfitting
- D. Low accuracy

18. Which of the following is a supervised learning task?

- A. Clustering
- B. Classification
- C. Dimensionality reduction
- D. Association rule mining

19. What is the role of bias in a neuron?

- A. To scale the output
- B. To shift the activation
- C. To reduce error
- D. To store weights

20. What does the acronym “ML” stand for?

- A. Machine Logic
- B. Machine Learning
- C. Model Layer
- D. Memory Loop

### **Short Essay Questions**

Based on your understanding and in your own words,

1. Explain the concept of backpropagation and its role in training neural networks. (4 marks)
2. Describe how activation functions contribute to the learning capability of neural networks. (4 marks)
3. Discuss the similarities and differences between the human brain and artificial neural networks.  
(4 marks)
4. How does gradient descent help in minimizing the loss function during training?
5. What are the challenges of training deep neural networks and how can they be mitigated?

### True/False Questions (HIGHLIGHT THE CORRECT ANSWERS)

1. Neural networks are inspired by the human brain. (TRUE / FALSE )
2. Backpropagation increases the error in the network. (TRUE / FALSE )
3. The input layer is responsible for producing predictions. (TRUE / FALSE )
4. Activation functions help introduce non-linearity. (TRUE / FALSE )
5. Weights in a neural network remain constant during training. (TRUE / FALSE )
6. Bias helps shift the activation function. (TRUE / FALSE )
7. Feedforward is the process of sending data backward. (TRUE / FALSE )
8. Gradient descent is used to update weights. (TRUE / FALSE )
9. Overfitting occurs when a model performs well on training data but poorly on unseen data.  
(TRUE / FALSE )
10. The loss function measures the accuracy of predictions. (TRUE / FALSE )
11. Neural networks can only be used for image recognition. (TRUE / FALSE )
12. The output layer provides the final result of the network. (TRUE / FALSE )
13. Epoch refers to a single neuron activation. (TRUE / FALSE )
14. Regularization helps prevent overfitting. (TRUE / FALSE )
15. Deep learning is a subset of machine learning. (TRUE / FALSE )