Pre Lab:-

1. What is the difference between Single layer perceptron and multi-layer perceptron?
A single-layer perceptron has only one layer of neurons, while a multi-layer perceptron has multiple layers, including hidden layers, allowing it to solve more complex problems.

2. What is the Vanishing Gradient Problem?
The vanishing gradient problem occurs when gradients become too small during backpropagation, preventing the weights in earlier layers from being updated effectively.

3. The nodes in the input layer are 10 and that in the hidden layer is 5. The max connections from the input layer to the hidden layer are?
The maximum number of connections is $10 \times 5 = 50$.

VIVA:-

1. Describe the architecture of your simple multi-layer perceptron.
The MLP consists of an input layer, one or more hidden layers, and an output layer, where each layer is fully connected to the next, with neurons applying activation functions to process inputs.

2. How does the choice of activation function impact the network's ability to learn complex patterns?
The activation function introduces non-linearity, enabling the network to learn complex patterns and relationships that a linear model cannot capture.

3. What activation functions did you use in your MLP, and why were these specific functions chosen?
Common choices are ReLU for hidden layers due to its efficiency in mitigating vanishing gradients, and softmax or sigmoid for the output layer to handle classification problems.

4. How does backpropagation work in the context of a simple MLP, and how are the weights updated during training?
Backpropagation calculates the error at the output and propagates it backward through the layers, adjusting the weights using gradient descent to minimize the loss function.