Assignment 5

In training a neural network using back-propagation algorithm:
1. The choice of activation functions is important.
2. The network’s weights are initialized randomly.
3. The choice of learning rate affects the training process.
4. The choice of optimization algorithm influences the training speed.
5. The choice of network architecture affects the model’s performance.

2. Which of the following is not a valid method of initialization of weights for training a neural network?
   a. Random initialization
   b. He initializations
   c. Xavier initializations
   d. All of the above

3. In the generalized delta rule for updating weights at nth iteration of a single-propagation network:
   a. The weight update is proportional to the error function.
   b. The learning rate is constant.
   c. The weight update is proportional to the gradient of the error function.
   d. The weights are updated once per epoch.

4. The momentum constant (α) and the general delay (δ) can be adjusted to:
   a. Increase the learning rate.
   b. Decrease the learning rate.
   c. Increase the stability of the algorithm.
   d. None of the above

5. During numerical training of a small feed-forward neural network, the learning rate can:
   a. Be increased to speed up training.
   b. Be decreased to prevent overfitting.
   c. Be kept constant for all epochs.
   d. None of the above

6. Match the following statements to increase the number of hidden layers:
   a. Reducing the learning rate
   b. Increasing the number of neurons in each layer
   c. Using a larger input dataset
   d. Initializing weights with Xavier initialization

7. The number of hidden layers in the Radial Basis Function network is:
   a. 3 or more
   b. 2 or more
   c. 1 or more
   d. None of the above

8. A valid activation function used in Radial Basis Function networks generally satisfy the following properties:
   a. Non-linearity
   b. Monotonicity
   c. Differentiability
   d. None of the above

9. Which of the following statements is true about Radial Basis Function networks compared to other neural networks?
   a. They require more training data.
   b. They are less susceptible to overfitting.
   c. They are more computationally expensive.
   d. They are not suitable for high-dimensional data.

10. What are the following statements about Radial Basis Function networks compared to other neural networks?
    a. They have a single hidden layer.
    b. They are more interpretable.
    c. They are less prone to underfitting.
    d. They are better suited for regression tasks.