Multiple-Choice Questionnaire on Neural Networks

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1. **Forward propagation** in neural networks refers to:

   a) Weight initialization
   b) Error calculation
   c) Activation propagation from input to output
   d) Gradient computation

2. **Backpropagation** is primarily used to:

   a) Initialize network weights
   b) Compute network activations
   c) Update weights by minimizing errors
   d) Normalize inputs

3. **Gradients** in neural networks indicate:

   a) Direction of maximum increase
   b) Network accuracy
   c) Activation levels
   d) Computational efficiency

4. Which function is commonly used as an **activation function**?

   a) Gradient descent
   b) Cross-entropy
   c) ReLU
   d) Backpropagation

5. In a **computational graph**, nodes typically represent:

   a) Weights only
   b) Mathematical operations and variables
   c) Activations only
   d) Outputs only

6. Which algorithm commonly optimizes neural networks?

   a) Forward propagation
   b) Gradient descent
   c) Error propagation
   d) Linear regression

7. The **sigmoid activation** function outputs values:

   a) Between 0 and 1
   b) Between -1 and 1
   c) Between negative infinity and infinity
   d) Exactly 0 or 1

8. The **vanishing gradient** problem refers to:

   a) Gradients becoming excessively large
   b) Gradients becoming excessively small
   c) Inputs vanishing during training
   d) Errors increasing during training

9. The derivative of **ReLU activation** for negative inputs is:

   a) 1
   b) 0
   c) -1
   d) Infinity

10. **Weight updates** during backpropagation depend primarily on:

    a) Learning rate and gradient
    b) Input normalization
    c) Output accuracy
    d) Activation choice

"The only source of knowledge is experience." – Albert Einstein