Quiz 2: Perceptrons and Multilayer Perceptrons

1. Which one of the following is the perceptron’s input function?
   (a) \( u(x) = w_ix_i \)
   (b) \( u(x) = \sum_{i=1}^{n} w_ix_i \)
   (c) \( u(x) = \sum_{i=1}^{n} w_i \)

2. Which of the following graphs illustrates a step function?
   (a) graphs 3 and 2
   (b) graph 1 and 3
   (c) graph 2
   (d) graph 1 and 2
3. Perceptron-computable functions are those for which the points whose function value is 0 can be separated from the points whose function value is 1 using a line. Which functions do the following separations of the input space correspond to?

![Diagram of separations](image)

(a) XOR and OR  
(b) AND and OR  
(c) OR and AND  
(d) XOR

4. What is the delta rule?

(a) the perceptron’s update rule  
(b) a measure of the difference between the actual network output and the target output  
(c) a gradient descent learning rule for updating the weights of the inputs in MLPs

5. What is the difference between Wickelphones and Wickelfeatures?

(a) There is no difference between Wickelphones and Wickelfeatures  
(b) Wickelphones represent a phoneme and its immediate context; Wickelfeatures are coarse grained encodings of Wickelphones  
(c) Wickelfeatures are features for representing the past tense

6. What is the error function used in the backpropagation algorithm?

(a) the difference between target and obtained output  
(b) the sigmoid function  
(c) the mean squared error

7. Which of the following is not a property of Parallel Distributed Processing (PDP) models?

(a) memory and knowledge for specific things are not stored explicitly, but stored in the connections between units  
(b) information processing takes place through interactions of large numbers of simple neuron-like processing units  
(c) the network is able to form generalizations from examples  
(d) learning occurs with gradual changes in connection strength by experience.