Q1. Consider a comparison between a sigmoid function and a rectified linear unit (ReLU). Which of following statement is NOT true?

A. Sigmoid function is more expensive to compute

B. ReLU has non-zero gradient everywhere

C. Sigmoid has a large zone that has nonzero gradient

D. The gradient of ReLU on positive inputs is 1

Q2. Let us compare a convolutional layer vs. a standard fully connected layer. Which of the following is TRUE?

A. Convolution layer has more parameters

B. Fully connected layer can be used to represent the convolution

C. Convolution layer can be used to represent fully connected layer

D. Fully connected layer is more efficient

Q3. Which one of the following layers has the **fewest** parameters to be learned during training?

A. A convolutional layer with 12 filters. Each filter is 3 x 3 operating on a single channel image.

B. A convolutional layer with 4 filters. Each filter is 6 x 6 operating on a single channel image.

C. A fully-connected layer that maps the outputs of 12 hidden units to 3 output units.

D. A max-pooling layer that reduces a 12 x 12 feature map to 6 x 6.

Q4. Which one of the following statement is true about neural networks?

A. The output of a max pooling layer is linear of its inputs.

B. The performance of a neural network will always benefit by simply adding more layers.

C. A convolutional layer can be represented by a fully connected layer.

D. A fully connected layer can be represented by a convolutional layer.

Q5. Consider one dimensional convolution. The input is [1, 2, 3, 4]. The kernel is [1, 0, 1]. Use no padding and use stride 1. What is the output?

Q6. Consider max pooling on a one-dimensional vector with kernel (filter) size 4 and stride 1. With the input [7,7,3,9,2], what is the output?

Q7. Consider a convolution layer with 32 filters. Each filter has size (height x width) 11x11, and 3 channels. Use padding 2x4, and stride 2x2. Given an input image of 32x32, and 3 channels, what is the output size? Write the answer in the format of #output channels x height x width.