1. Why don't we start all of the weights with zeros?

Ans. If all the weights are initialized to zeros, the derivatives will remain same for every w in W[l]. As a result, neurons will learn same features in each iterations. This problem is known as network failing to break symmetry. And not only zero, any constant initialization will produce a poor result.

2. Why is it beneficial to start weights with a mean zero distribution?

Ans. The aim of weight initialization is to prevent layer activation outputs from exploding or vanishing during the course of a forward pass through a deep neural network.

3. What is dilated convolution, and how does it work?

Ans. Dilated Convolution: It is a technique that expands the kernel (input) by inserting holes between its consecutive elements. In simpler terms, it is the same as convolution but it involves pixel skipping, so as to cover a larger area of the input.

4. What is TRANSPOSED CONVOLUTION, and how does it work?

Ans. Transposed convolutions are standard convolutions but with a modified input feature map. The stride and padding do not correspond to the number of zeros added around the image and the amount of shift in the kernel when sliding it across the input, as they would in a standard convolution operation.

5.Explain Separable convolution

Ans. A Separable Convolution is a process in which a single convolution can be divided into two or more convolutions to produce the same output. A single process is divided into two or more sub-processes to achieve the same effect. Let's understand Separable Convolutions, their types in-depth with examples.

6.What is depthwise convolution, and how does it work?

Ans. Depthwise Convolution is a type of convolution where we apply a single convolutional filter for each input channel. In the regular 2D convolution performed over multiple input channels, the filter is as deep as the input and lets us freely mix channels to generate each element in the output.

7.What is Depthwise separable convolution, and how does it work?

Ans. Depthwise Convolution is a type of convolution where we apply a single convolutional filter for each input channel. In the regular 2D convolution performed over multiple input channels, the filter is as deep as the input and lets us freely mix channels to generate each element in the output.

8.Capsule networks are what they sound like.

Ans. Capsule Networks (CapsNet) are the networks that are able to fetch spatial information and more important features so as to overcome the loss of information that is seen in pooling operations. Let us see what is the difference between a capsule and a neuron. Capsule gives us a vector as an output that has a direction.

9. Why is POOLING such an important operation in CNNs?

Ans. Pooling layers are used to reduce the dimensions of the feature maps. Thus, it reduces the number of parameters to learn and the amount of computation performed in the network. The pooling layer summarises the features present in a region of the feature map generated by a convolution layer.

10. What are receptive fields and how do they work?

Ans. The receptive field encompasses the sensory receptors that feed into sensory neurons and thus includes specific receptors on a neuron as well as collectives of receptors that are capable of activating a neuron via synaptic connections.