Note: Please google a question if you do not understand it from the video lecture. Idea is to give you breadth wise knowledge of deep learning.

Video 12

Q1. Difference between linear model and non-linear model

Ans. Difference between linear and nonlinear regression is that linear regression involves lines and nonlinear regression involves curves.

Q2. What are the advantages and disadvantages of linear model?

Ans. Advantages:  
Less computation powers.

Linear models are not complex.

Linear model are stable.

The derivatives of linear model are constant.

Disadvantages:

Not effective in extra combinations.

Efficient for linear data only

Q3. What are total number of parameters can a linear model have?

Ans. Total no of parameters supported by linear model are (n+1)\*K.

Q4. How will you describe data in real world? Does it follow linear model or non-linear model? Give examples.

Ans. Real world data is data associated with real world problems and have outcomes. It mostly follows linear model

Video 13

Q1. What is shallow deep learning frame works?

Ans. Shallow Learning is that Deep Learning methods derive their own features directly from data (feature learning), while Shallow Learning relies on handcrafted features based upon heuristics of the target problem

Q2. Please enlist (shallow and deep) deep learning frameworks?

Ans. The deep learning frameworks are:

1. TensorFlow

2. Keyras

3. PyTorch

4. Theano

5. Caffe

6. Deeplearning

Q3. What is activation function? Give example one activation function?

Ans. An activation function is a function that is added into an artificial neural network in order to decide whether the neuron should be activated or not by calculating weighted sum and further adding bias with it and to introduce non-linearity into the output of neuron.

Q4. What essential components a deep learning architecture include?

Ans. A deep learning architecture must include 3 major layers: the input layer, hidden layers, output layer

Video 14

Q1. What is chain rule?

Ans. Deep learning imposes multiple mappings and performs multiple mapping operations on the input. In theory, the performance of multiple mapping will be higher than a single mapping. The derivation chain rule is a rule used to calculate cost derivate variable parameters in each map in order.

Q2. What is the most important use case of chain rule in the domain of AI?

Ans. Backpropagation in AI is the most significant use case.

Q3. How the chain rule is beneficial in deep learning?

Ans. The derivation chain rule is a rule used to calculate cost derivate variable parameters in each map in order.

Q4. Is chain rule more important to textual data as compared to vision data? Do you agree?

Ans. It is important for both types of data

Video 15

Q1. What is forward propagation?

Ans. The process of steps for combining the linear models through an activation function for getting an output Y is called forward propagation.

Q2. What is backward propagation?

Ans. The process of going back to input through output of a model including derivatives also is callled backward propagation. It is very helpful in the update interval of weights.

Q3. Forward propagation is more complex then backward propagation. Is this statement true?

Ans. No. Backward propagation is more complex as it involves derivatives. It is 2 time more complex than forward propagation.

Q4. Backward propagation is the reason behind success of deep learning models? Is this statement true?

Ans. Yes. Backward propagation is important as it updates weights. Updation of weights results in optimization and gives better results for classification.

Video 16

Q1. What is over fitting?

Ans. Overfitting is when the model sits too well with the training data. The model has the extra capacity to learn the noise in data. An overfit model overstretches itself and ignores domains not covered by the data.

Q2. What is under fitting?

Ans. Underfitting is when the model hasn't learned enough. It refers to a model that can neither model the training data nor generalize to new data.

Q3. How can we make our model not to go towards under fitting/over fitting?

Ans. Under fitting preventions:

- Increase number of parameters.

- Increase complex nature of models.

- Increase the training time till cost function minimized.

Over fitting preventions:

- Regularization

- Cross Validation

- Early stopping

- Cross validation

Q4 What are the scenarios where we want to have over fitted/under fitted models for our data?

Scenerio where we want our model to be underfitted then we have to model the expected value of target variable as nth degree polynomial yielding the general Polynomial.The training error will tend to decrease as we increase degree d of the polynomial. At the same time, the cross validation error will tend to decrease as we increase d up to a point, and then it will increase as d is increased, forming a convex curve. To solve the problem of overfitting in our model we need to increase  
flexibility of our model.

Video 17 (Deep Learning neural networks) (Skip video 18, its same as Video 17)

Q1. What are neural networks? Can we build deep learning model with less computation? (google).

Ans. A neural network is a series of algorithms that endeavors to recognize underlying relationships in a set of data through a process that mimics the way the human brain operates. With small data, we can build deep learning model less computation.

Q2. Can you enlist some of the most famous scholars (scientists) involved in the area of deep learning? Please search their contributions and provide one liner for each contribution.

Ans. -Andrew Ng:

He led the development of Stanford University’s main MOOC (Massive Open Online Courses) platform and taught an online Machine Learning class.

-Fei-Fei Li:

Dr. Li served as the Director of Stanford’s AI Lab from 2013 to 2018.During a sabbatical in 2017 and 2018, she was Vice President at Google and served as Chief Scientist of AI/ML at Google Cloud.

-Geoffrey Hinton:

gave an overview of the foundations of deep learning.

Q3. What is the concept of plateau in model optimization?

Ans. In Deep learning, with the increase in data, the accuracy tends to increases until 100%. Plateau means constant. Older algorithms performance become constant after some time.

Video 19 (How deep learning works?)

Q1. What are the purposes of hidden layers in Deep learning?

Ans. A neural network is a series of algorithms that endeavors to recognize underlying relationships in a set of data through a process that mimics the way the human brain operates.With small data, we can build deep learning model less computation.

Q2. What are multi layers perceptron?

Ans. Multilayer perceptron train on a set of input-output pairs and learn to model the correlation and interdependencies between those inputs and outputs.

Q3. What are synapses?

Ans. Synapse is the connection between nodes or neurons in an artificial neural network. Each synapse has a different level of influence/trigger on whether that neuron "fires" and activates the next neuron.

Q4. How can we differentiate between the person who makes most use of his right brain in comparison to the person who uses his left brain?

Ans. If you're mostly analytical and methodical in your thinking, you’re theoretically said to be left-brained. If you tend to be more creative or artistic, you're theoretically said to be right-brained.

Q5. Being a computer science student, which side of brain is more important, i.e., left side or right side?

Ans. Being a CS student you ought to be left brained because of allow the logics and analytics involved to solve a problem.