**Module 1:**

**Chap-9 Unsupervised Learning Techniques**

1. Explain k-means clustering with neat diagram and relevant code. PAGE 240
2. What is Bayesian Gaussian Mixture Models? Illustrate through python code how they are incorporated in unsupervised learning. PAGE 270
3. Explain Gaussian mixture model along with interpretation. How anamolies are detected using Gaussian Mixtures? PAGE 266
4. Explain DBSCAN algorithm. PAGE 256
5. Explain how clustering is used for PAGE 251 - 256
6. Preprocessing
7. Image segmentation
8. Semi-supervised learning
9. Write a note on clustering. Explain accelerated K-Means and Mini-batch K-Means clustering. PAGE 245
10. Explain Linear regression using Tensorflow.

**Chap 10 Introduction to Artificial Neural Networks with Keras**

1. Explain how ANN evolved from biological neurons. Illustrate how logical computations are accomplished using neurons. PAGE 279
2. Explain perceptron, Threshold logic unit, perceptron learning rule with code. PAGE 281
3. Explain multi-layer perceptron and backpropogation. PAGE 286
4. What are Regression MLPs, Classification MLPs. Illustrate how MLPS are implemented with Keras. PAGE 292
5. With relavent python code explain how to build the following models
6. a Regression MLP using the sequential API. PAGE 303
7. a Complex Model using the functional API. PAGE 304
8. a Dynamic Model Using the Subclassing API PAGE 309
9. How Fine-Tuning Neural Network Hyperparameters are achieved in deep learning? PAGE 315

**MODULE 2**

**Chap 11- Training Deep Neural Networks**

1. Explain Glarot Initialization and Nonsaturating Activation Functions. PAGE 327 AND 329
2. Explain batch normalization algorithm with relevant coding PAGE 333
3. Explain the following concepts with relevant python code: PAGE 338 - 344
4. Gradient Clipping
5. Reusing Pretrained Layers
6. Transfer Learning With Keras
7. Unsupervised Pretraining
8. Pretraining on an Auxiliary Task
9. What are fast optimizers? Explain Momentum optimization, Nesterov Accelerated Gradient, AdaGrad, RMSProp, and Adam & Nadam optimization. PAGE 347 - 349
10. How to avoid Overfitting through regularization? (ℓ1 and ℓ2 regularization, dropout ..monte carlo dropout and max-norm regularization must be explained) PAGE 356 - 362