**Syllabus & QB for AI& DS-II IA2**

**Unit 4:**

1. Explain ANN with a neat architecture diagram.

1. what is the need and List down the types of activation / threshold functions
2. What is the need of activation function in an ANN?
3. Explain the vanishing gradient activation function, linear activation function, exploding gradient fucntion ?
4. Is there any difference between a feed forward ANN and fee backwards ANN

1. Explain multi-layer recurrent network or multi layered feed forward network
2. List down some of the application that NN,can do but not DL but dL can do but not RNN , CNN or explain in detail Credit card fraud detection using Ann as an example
3. Compare and contrast between Machine Learning Vs Deep Learning
4. Explain the working of Deep Learning (DL), RNN in detail with a neat diagram
5. What are the different types of RNN? Give two applications for each of them?
6. What is the limitation of RNN, which can be overcome by LSTM?
7. Describe the working of LSTM in detail with a neat diagram?
8. What are the 5 components LSTM network should contain >
9. Explain with a neat diagram a cell of an LSTM network?
10. What is Deep RNN? and mention of its application?
11. Describe the working model of CNN with help of a neat diagram
12. What are the different components of CNN and mention their functionality with help of an example.
13. What are the two phases or CNN?
14. Explain the dense layers of CNN network?
15. Give the difference between RNN, CNN and Deep RNN
16. Mention the difference between RNN, LSTM
17. Compare and contrast between feedforward and feedback word network of RNN
18. What is the advantage of CNN over RNN?
19. How Stride help in edge deduction during filtering or kernel stage of CNN
20. What are the steps need to be done before classification of images
21. In a dense layer 256\*256\*3 represents?
22. Why the dimension recedes during the stages of feature extraction of images?
23. What Is the advantage of doing padding during kernel or filtering stage of CNN
24. What is pooling in CNN? what are the two types of pooling methods?
25. What is the advantage of pooling stage in CNN?
26. What do you mean by flattening in CNN
27. Mention at least 5 parameter or properties of CNN?
28. How many layers are there in the CNN
29. What is the use of Autoencoder in Neural Network (NN)
30. How to reduce the dimension or data compression of NN
31. What is the need of Autoencoder over Principal Components analysis (PCS)
32. Define Autoencoder?
33. What is he the components of encoder?
34. What are the properties of autoencoder?
35. What are the hyperparameter for training Autoencoder?
36. Explain the architecture of Autoencoder?
37. What are the types of Autoencoders and give their examples of each type?
38. What are the necessities of Convolutional Autoencoder?List two case studies of Convolutional Autoencoder?
39. What are the necessities of ovulational Autoencoder?List two case studies of Convolutional Autoencoder?
40. What are the necessities of Latent Autoencoder?List two case studies of Latent Autoencoder?
41. What are the necessities of Deep Autoencoder?List two case studies of Contractive Autoencoder?
42. What are the necessities of Sparse Autoencoder?List two case studies of Sparse Autoencoder?

**Unit 6:**

1. Mention top 20 research application of DL and Mention some case studies of DL
2. Mention some industrial dimensions where DL is used

**Unit 5: Advanced ML classification**

1. Give the list of ensemble methods . List down the method to improve classification accuracy of a class of imbalanced data
2. Compare and contrast between boosting, bagging and stacking
3. Give the relation between bias and variance
4. Explain these 10 techniques
   1. SMOTE
   2. Under sampling
   3. Over sampling
   4. Resampling
   5. Cross validation / k fold method
   6. Random sampling
   7. Holdout methods
5. What is the list of parameters for model evaluation or selection of models or evaluate the performance metrics of Machine Learning or classifier evaluation technique
6. List down and explain in a line the boosting techniques for Imbalanced learn
7. Compare and contrast between adaptive and gradient and XG boosting model