

UNIT-1:

10 Mark

1) When more non-linearities are present then the neural networks fail. Illustrate how Multi-Layer Perceptron is used to overcome the issues of Linear Inseparability with necessary examples and diagrams **PAGE 42-45 UNIT-1**

2) When more non-linearities are present then the neural networks fail. Illustrate how Multi-Layer Perceptron is used to overcome the issues of Linear Inseparability with necessary examples and diagrams **PAGE 42-45 UNIT-1**

3) An image processing engineer working in a disaster monitoring and mitigating agency is involved in identifying the water bodies and marking the boundaries of these water resources from satellite images. Help him by suggesting an appropriate Single-layer feed forward procedure which classifies the water bodies from other regions. Also comment on the pros and cons of the algorithm used in this process.

PAGE 35-37 UNIT-1

Advantages

1) *Single Layer Perceptron is quite easy to set up and train.*

2) The SLP outputs a function which is a sigmoid and that sigmoid function can easily be linked to posterior probabilities.

3) *The neural network model can be explicitly linked to statistical models which means the model can be used to share covariance Gaussian density function.*

4) A Real Estate company has developed a multi- story apartment building. As a Machine Learning Expert your tasked with the identification of potential buyers. Suggest a suitable regression-based classifier for the company

PAGE 88-95 UNIT-1

5) When the weights in Neural networks is being updated, most of the time it gets trapped in a local minimum point. This disadvantage has to be removed. Recommend a suitable stochastic based algorithm to avoid this disadvantage.

PAGE 108,109, 110

6) Without training, the Neural Networks cannot converge. As an Artificial Intelligence expert explain the different training procedures used for structured and unstructured data along with the concept of penalty-based training method.

PAGE 30, 31, 32

UNIT-2:

1) Appraise on how the Generative Adversarial Networks (GAN's) are used to develop generative model for unsupervised learning in detail. **PAGE 57-62**

2) Activation function is used to provide the output response in a neural network. Explain the different activation functions used in Deep Learning Networks in detail. **ANS:**

https://www.upgrad.com/blog/types-of-activation-function-in-neural-networks/#Types_of_Activation_Functions

3) Consider an Image data set having 1000 images of four legged animals like cat, dog, horse etc. The size of the images 1024 X 786 pixels. Examine how a Convolution Neural Network (CNN) is used in the classification of cat from the given set of four-legged animals image dataset. **PAGE: 63-70**

4) As a Deep Learning Network expert, you are tasked with design and development of a facial recognition system for a high security facility. Apply a suitable back propagation-based procedure for the above-mentioned task. **PAGE 18-26 WE CAN SKIP DELTA LEARNING LAW**

5) As a data analyst you were assigned to develop a software package for detection of cancer cells from the breast regions. The data provided to you has lot of outliers and traditional algorithms leads to overfitting. Suggest an appropriate technique which is used to pre-process data so that the effect of overfitting is removed in detail.

REGULARISATION

6) As an AI expert you are tasked with the development of a Breast cancer classification algorithm. Suggest a suitable feed forward supervised gradient-based procedure with necessary diagram, expressions and also specify how it guarantees a fast convergence? **PAGE 18-26 WE CAN SKIP DELTA LEARNING LAW**

UNIT-3:

1) Principle Component Analysis (PCA) is used to reduce the dimensionality issue Appraise on the various steps involved in Principle Component analysis (PCA) in detail. **PCA PAGE 9-24**

2) In Medical CT images, segmented outcomes can be split into further or can be merged to give new information's which helps us to make a good Decision. Enumerate how Alexnet can be used for the detection and identification of cancer cells from the given CT images.

ALEXNET PAGE 47-50

3) Appraise on how Autoencoders are used to learn efficient coding's of unlabelled data by assuming suitable example. **AUTOENCODERS PAGE 43-46**

4) Deep neural networks are complex networks with more hidden layers. Discuss in detail the use of Resnet in training deep networks with more than 150 plus layers successfully with neat diagram. **RESNET PAGE 47-50**

5) Explain how VGG net outperforms Alex net or Google net by just replacing the large kernel filters with necessary diagrams? **VGG PAGE 51-52**

6) Elucidate on the process involved in the training and batch normalization of a convnet in detail. **BATCH NORMALIZATION**

<https://www.analyticsvidhya.com/blog/2021/03/introduction-to-batch-normalization/>

UNIT-4:

1) Explain the Architecture and working procedure of Recurrent Networks with neat diagram. **RNN PAGE 14,15,16**

- 2) Deep networks are used in Natural Language processing for developing models which can recognize texts in a more efficient way. In this regard exemplify the Word Level Recurrent Neural architecture for generating text. **RNN PAGE 14,15,16**
- 3) Interpret and elaborate the architecture and working of LSTM networks for image recognition application **PAGE 16-21**
- 4) A French national is invited to speak at a school function. He delivers his lecture in French. His speech has to be translated automatically to the regional language by machines. Suggest a suitable language translational model for the above-mentioned purpose. **PAGE 16-21**
- 5) As a Deep learning Expert suggest a suitable model which is an adaptation of RNN's and is better than RNN and performs spatial transformation on the given input images. **PAGE 11,12,13**
- 6) Appraise on the various optimization schemes used by Deep learning architectures to obtain a better accuracy rate in detail **PAGE 8,9,10 CONVEX AND NON CONVEX OPTIMIZATION**

UNIT-5:

- 1) Suggest a suitable network using by which the audio signals are used to generate relatively realistic-sounding human-like voices by modelling waveforms trained with recordings of real speech? **WAVENET: UNIT -5 PDF PAGE: 4-5**
 - 2) As an AI expert, Comment on a suitable Deep learning methodology involved in human knee joint detection application. **WRITE ABOUT CNN**
 - 3) As a forensic expert you are tasked with matching two different crime scenes. Appraise on a suitable Deep Learning model for scene matching application in detail with necessary architecture diagrams. **EXPLAIN LSTM**
 - 4) A medical MRI image of a patient is annotated and text captions are inserted for helping the physicians. As a Deep Learning Expert suggest a suitable procedure to identify these text captions and to classify them. **LSTM REFER ABOVE**
 - 5) Explain the architecture and the merits of a Deep learning model which can be used to convert the given texts into speech **NLP EXPLANATION PAGE 6-7**
 - 6) Illustrate how deep learning procedures can be used in the field of Natural Language Processing(NLP). Also list the pros and cons of using DL methods in NLP area. **RNN PAGE 14-16**
- IN UNIT 5**