**WORKSHEET-1**

**DEEP LEARNING**

Q1 to Q8 are MCQs with only one correct answer. Choose the correct option.

1. Which of the following can approximate any function universally (i.e. universal approximators)?

A) Boosted Decision Trees B) Neural Networks

C) Kernel SVM D) All of the above

2. In which of the following domains we cannot use neural networks?

A) Image Processing B) Speech Processing

C) Fraud Detection D) None of the above

3. Rearrange the following steps of a gradient descent algorithm in correct order of their occurrence?

i. Initialize random weight and bias

ii. Repeat the process until you find the best weights of network

iii. Change weights and biases for each neuron to reduce the error

iv. Calculate error distances between the actual and the predicted value

v. Pass an input through the network and get values from output layer

Choose the correct option:

A) iv – i – iii – v – ii B) v – i – iii – iv –ii

C) i – v – iv – iii – ii D) i – v – iii –iv –ii

4. What is the full form of RNN?

A) Recurrent Neural Network B) Recursive Neural Network

C) Redundant Neural Network D) Resurrection Neural Network

5. What is plasticity in neural networks?

A) input pattern keeps on changing B) input pattern has become static

C) output pattern keeps on changing D) output is static

6. What is stability plasticity dilemma?

A) system can neither be stable nor plastic B) static inputs & categorization can’t be handled C) dynamic inputs & categorization can’t be handled D) none of the above

7. Read the following statements:

Statement 1: It is possible to train a network well by initializing all the weights as 0

Statement 2: It is possible to train a network well by initializing biases as 0

Which of the statements given above is true, Choose the correct option?

1. Statement 1 is true while Statement 2 is false
2. Statement 2 is true while statement 1 is false
3. Both statements are true
4. Both statements are false

8. Which of the following architecture has feedback connections?

A) Recurrent Neural network B) Convolutional Neural Network C) Restricted Boltzmann Machine D) simple Artificial Neural Network

Q9 and Q10 are MCQs with one or more correct answers. Choose all the correct options. 9.

In training a neural network, you notice that the loss does not decrease in the few starting epochs. The reason behind it could be

A) Learning Rate is low B) Regularisation parameter is high

C) Regularisation parameter is low D) Stuck at local minima

10. Which of the following function(s) can be used to impart non – linearity in a neural network?

A) Stochastic Gradient Descent B) Rectified Linear Unit

C) Convolution Function D) Sigmoid Function

Q11 to Q15 are subjective answer type question. Answer them briefly.

11. What is Deep Learning?

Deep learning is an [artificial intelligence (AI)](https://www.investopedia.com/terms/a/artificial-intelligence-ai.asp) function that imitates the workings of the human brain in processing data and creating patterns for use in decision making. Deep learning is a subset of [machine learning](https://www.investopedia.com/terms/m/machine-learning.asp) in artificial intelligence that has networks capable of learning unsupervised from data that is unstructured or unlabeled. Also known as deep neural learning or deep neural network.

12. What is reinforcement learning?

Reinforcement learning is an area of machine learning concerned with how software agents ought to take actions in an environment in order to maximize the notion of cumulative reward. Reinforcement learning is one of three basic machine learning paradigms, alongside supervised learning and unsupervised learning.

13. What Are the Differences Between Machine Learning and Deep Learning?

**Machine learning**is a subset of artificial intelligence associated with creating algorithms that can change themselves without human intervention to get the desired result – by feeding themselves through structured data.

**Deep learning** is a subset of machine learning where algorithms are created and function similarly to machine learning, but there are many levels of these algorithms, each providing a different interpretation of the data it conveys. This network of algorithms is called artificial neural networks. In simple words, it resembles the neural connections that exist in the human brain.

Differences between deep learning and machine learning:

1. The main difference between deep learning and machine learning is due to the way data is presented in the system. Machine learning algorithms almost always require structured data, while deep learning networks rely on layers of ANN (artificial neural networks).
2. Machine learning algorithms are designed to “learn” to act by understanding labeled data and then use it to produce new results with more datasets. However, when the result is incorrect, there is a need to “teach them”.
3. Deep learning networks do not require human intervention, as multilevel layers in neural networks place data in a hierarchy of different concepts, which ultimately learn from their own mistakes. However, even they can be wrong if the data quality is not good enough.
4. Data decides everything. It is the quality of the data that ultimately determines the quality of the result.

14. What is a perceptron?

A perceptron is a neural network unit (an artificial neuron) that does certain computations to detect features or business intelligence in the input data.

A Perceptron is an algorithm used for [supervised learning](https://deepai.org/machine-learning-glossary-and-terms/supervised-learning) of binary [classifiers](https://deepai.org/machine-learning-glossary-and-terms/classifier). Binary classifiers decide whether an input, usually represented by a series of [vectors](https://deepai.org/machine-learning-glossary-and-terms/vector), belongs to a specific class.

A Perceptron is a single-layer [neural network](https://deepai.org/machine-learning-glossary-and-terms/neural-network). They consist of four main parts including input values, weights and bias, net sum, and an [activation function](https://deepai.org/machine-learning-glossary-and-terms/activation-function).

15. What’s the difference between AI and ML?

Artificial intelligence is a technology using which we can create intelligent systems that can simulate human intelligence.

Machine learning is a subfield of artificial intelligence, which enables machines to learn from past data or experiences without being explicitly programmed.

Differences:

Artificial intelligence is a technology which enables a machine to simulate human behavior.

Machine learning is a subset of AI which allows a machine to automatically learn from past data without programming explicitly.

The goal of AI is to make a smart computer system like humans to solve complex problems.

The goal of ML is to allow machines to learn from data so that they can give accurate output.

In AI, we make intelligent systems to perform any task like a human.

In ML, we teach machines with data to perform a particular task and give an accurate result.

Machine learning and deep learning are the two main subsets of AI.

Deep learning is a main subset of machine learning.

AI has a very wide range of scope whereas Machine learning has a limited scope.