WORKSHEET-1 DEEP LEARNING

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

1. B) Neural Networks
2. B) Speech Processing
3. D) i – v – iii –iv –ii
4. A) Recurrent Neural Network
5. A) input pattern keeps on changing
6. C) dynamic inputs & categorization can’t be handled
7. B) Statement 2 is true while statement 1 is false
8. A) Recurrent Neural network

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

1. A) Learning Rate is low B) Regularisation parameter is high D) Stuck at local minima
2. A) Stochastic Gradient Descent

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

1. Deep learning (also known as deep structured learning) is part of a broader family of machine learning methods based on artificial neural networks with representation learning. Learning can be supervised, semi-supervised or unsupervised.

Deep learning is a class of machine learning algorithms that uses multiple layers to progressively extract higher-level features from the raw input. For example, in image processing, lower layers may identify edges, while higher layers may identify the concepts relevant to a human such as digits or letters or faces.

1. Reinforcement learning is an area of Machine Learning. It is about taking suitable action to maximize reward in a particular situation. It is employed by various software and machines to find the best possible behavior or path it should take in a specific situation. Reinforcement learning differs from the supervised learning in a way that in supervised learning the training data has the answer key with it so the model is trained with the correct answer itself whereas in reinforcement learning, there is no answer but the reinforcement agent decides what to do to perform the given task. In the absence of a training dataset, it is bound to learn from its experience.

| **S.NO.** | **MACHINE LEARNING** | **DEEP LEARNING** |
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| 1. | Machine Learning is a superset of Deep Learning | Deep Learning is a subset of Machine Learning |
| 2. | The data represented in Machine Learning is quite different as compared to Deep Learning as it uses structured data | The data representation is used in Deep Learning is quite different as it uses neural networks(ANN). |
| 3. | Machine Learning is an evolution of AI | Deep Learning is an evolution to Machine Learning. Basically it is how deep is the machine learning. |
| 4. | Machine learning consists of thousands of data points. | Big Data: Millions of data points. |
| 5. | Outputs: Numerical Value, like classification of score | Anything from numerical values to free-form elements, such as free text and sound. |
| 6. | Uses various types of automated algorithms that turn to model functions and predict future action from data. | Uses neural network that passes data through processing layers to the interpret data features and relations. |
| 7. | Algorithms are detected by data analysts to examine specific variables in data sets. | Algorithms are largely self-depicted on data analysis once they’re put into production. |
| 8. | Machine Learning is highly used to stay in the competition and learn new things. | Deep Learning solves complex machine learning issues. |

1. **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.

Perceptron was introduced by Frank Rosenblatt in 1957. He proposed a Perceptron learning rule based on the original MCP neuron.

A Perceptron is an algorithm for supervised learning of binary classifiers. This algorithm enables neurons to learn and processes elements in the training set one at a time.

**There are two types of Perceptrons**: Single layer and Multilayer.

**Single layer Perceptrons** can learn only linearly separable patterns.

**Multilayer Perceptrons** or feedforward neural networks with two or more layers have the greater processing power.

The Perceptron algorithm learns the weights for the input signals in order to draw a linear decision boundary.

This enables you to distinguish between the two linearly separable classes +1 and -1.

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| **Artificial Intelligence** | **Machine learning** |
| 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. | Machine learning has a limited scope. |
| AI is working to create an intelligent system which can perform various complex tasks. | Machine learning is working to create machines that can perform only those specific tasks for which they are trained. |
| AI system is concerned about maximizing the chances of success. | Machine learning is mainly concerned about accuracy and patterns. |
| The main applications of AI are **Siri, customer support using catboats**, Expert System, Online game playing, intelligent humanoid robot, etc. | The main applications of machine learning are **Online recommender system**, **Google search algorithms**, **Facebook auto friend tagging suggestions**, etc. |
| On the basis of capabilities, AI can be divided into three types, which are, **Weak AI**, **General AI**, and **Strong AI**. | Machine learning can also be divided into mainly three types that are **Supervised learning**, **Unsupervised learning**, and **Reinforcement learning**. |
| It includes learning, reasoning, and self-correction. | It includes learning and self-correction when introduced with new data. |
| AI completely deals with Structured, semi-structured, and unstructured data. | Machine learning deals with Structured and semi-structured data. |