**Deep Learning Worksheet Answers**

1.B) Neural networks

2.C) Fraud Detection

3.C) i – v – iv – iii – ii

4.A) Recurrent Neural Network

5.A) Input patterns keep 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 Networks

**9.** A,B & D

**10.** B

**11.** Deep learning is a machine learning technique that teaches computers to do what comes naturally to humans: learn by example. Deep learning is a key technology behind driverless cars, enabling them to recognize a stop sign, or to distinguish a pedestrian from a lamppost.

In deep learning, a computer model learns to perform classification tasks directly from images, text, or sound. Deep learning models can achieve state-of-the-art accuracy, sometimes exceeding human-level performance. Models are trained by using a large set of labeled data and neural network architectures that contain many layers.

**12.** Reinforcement learning is the training of machine learning models to make a sequence of decisions.The agent learns to achieve a goal in an uncertain, potentially complex environment. In reinforcement learning, an artificial intelligence faces a game-like situation.The computer employs trial and error to come up with a solution to the problem.To get the machine to do what the programmer wants, the artificial intelligence gets either rewards or penalties for the actions it performs. Its goal is to maximize the total reward.

## 13.Differences Between Machine Learning and Deep Learning

### 1. Human Intervention

### Whereas with machine learning systems, a human needs to identify and hand-code the applied features based on the data type (for example, pixel value, shape, orientation), a deep learning system tries to learn those features without additional human intervention. Take the case of a facial recognition program. The program first learns to detect and recognize edges and lines of faces, then more significant parts of the faces, and then finally the overall representations of faces. The amount of data involved in doing this is enormous, and as time goes on and the program trains itself, the probability of correct answers (that is, accurately identifying faces) increases. And that training happens through the use of neural networks, similar to the way the human brain works, without the need for a human to recode the program.

### 2. Hardware

Due to the amount of data being processed and the complexity of the mathematical calculations involved in the algorithms used, deep learning systems require much more powerful hardware than simpler machine learning systems. One type of hardware used for deep learning is graphical processing units (GPUs). Machine learning programs can run on lower-end machines without as much computing power.

### 3. Time

As you might expect, due to the huge data sets a deep learning system requires, and because there are so many parameters and complicated mathematical formulas involved, a deep learning system can take a lot of time to train. Machine learning can take as little time as a few seconds to a few hours, whereas deep learning can take a few hours to a few weeks!

### 4. Approach

Algorithms used in machine learning tend to parse data in parts, then those parts are combined to come up with a result or solution. Deep learning systems look at an entire problem or scenario in one fell swoop. For instance, if you wanted a program to identify particular objects in an image (what they are and where they are located—license plates on cars in a parking lot, for example), you would have to go through two steps with machine learning: first object detection and then object recognition. With the deep learning program, on the other hand, you would input the image, and with training, the program would return both the identified objects and their location in the image in one result.

### 5. Applications

Given all the other differences mentioned above, you probably have already figured out that machine learning and deep learning systems are used for different applications. Where they are used: Basic machine learning applications include predictive programs (such as for forecasting prices in the stock market or where and when the next hurricane will hit), email spam identifiers, and programs that design evidence-based treatment plans for medical patients. In addition to the examples mentioned above of Netflix, music-streaming services and facial recognition, one highly publicized application of deep learning is self-driving cars—the programs use many layers of neural networks to do things like determine objects to avoid, recognize traffic lights and know when to speed up or slow down.

**14.** In machine learning, the **perceptron** is an algorithm for supervised learning of binary classifiers. A binary classifier is a function which can decide whether or not an input, represented by a vector of numbers, belongs to some specific class. It is a type of linear classifier, i.e. a classification algorithm that makes its predictions based on a linear predictor function combining a set of weights with the feature vector.

**15.Differences in AI & ML**

* Main aim of AI is to increase the chances of success but no accuracy but on the other hand ML focuses on accuracy rather than success.
* AI goal is to stimulate natural intelligence to solve complex problems but the goal of ML is to learn from data for a certain task to maximize the performance of the machine.
* Primarily AI is used for decision making but ML allows the system to learn from the previous experience.
* AI develops a system to mimic humans, thus the system can respond and behave in certain circumstances but ML helps in self-learning algorithms.