Credit Hours: 3
Course Code: CS-447

Mid Term Exam
Machine Learning

Time allowed: 1:30 Hrs
Maximum Marks: 25

Question No: 1 **Marks [2+2+3+4+6+2+1=20]**

a. Explain the following challenges of machine learning with help of examples.
   a. Explainibilty b. Fairness in AI

b. Most of the ML algorithm if given the opportunity to have the capability of remembering things. Explain the phenomenon and the solution.

c. Is there any way to get data point distribution? If no, then what we can do? Is there a single distribution that can governs for all the data?

d. The following are the two methods to choose Hypothesis. Explain the following:
   a. Random b. Exhaustively

e. Define the following methods used for evaluating hypothesis function *(h)* with the help of equations.
   a. 0/1 Loss b. Squared Loss c. Absolute Loss

f. How the lifecycle of traditional programing differ from machine learning life cycle?

g. We think there is a particular class of algorithms, which are superior to every other Machine learning algorithms to solve every problem type. What do you think about this misconception?

Question No: 2 **Marks [5]**

a) Explain the following Machine learning setup with help of Feature space, Label space and Hypothesis space.

$$D = \{(\overrightarrow{x_1}, y_1),\ x_2, y_2\ , \dots\ x_n, y_n\ \} \subseteq X \times Y$$

Where,

$$(\overrightarrow{x_i}, y_i) \sim P(x, y)$$

Learn a function $h \in H$, such that for a new instance $(x, y) \sim P$,

$$h(x) \approx y$$