Date: 07-03-2023   **Assignment # 01**

Subject: Artificial Intelligence (AI)

Total Marks: 100

Weightage: 3

Deadline for submission is **16:00 PKT, Friday 17th March, 2023**.

Only Handwritten assignment will be accepted.

Topic: Decision Trees

Question 01)

Give decision trees to represent the following boolean functions, also report the values of Entorpy and Information Gain for each attribute split:

(a) A ∧ ¬B

(b) A ∨ [B ∧ C]

(c) A XOR B

(d) [A ∧ B] ∨ [C ∧ D]

Question 02)

A **decision graph** is a generalization of a decision tree that allows nodes (i.e., attributes used for splits) to have multiple parents, rather than just a single parent. The resulting graph must still be acyclic. Now, consider the XOR function of three binary input attributes, which produces the value 1 if and only if an odd number of the three input attributes has value 1.

1. Draw a minimal-sized decision tree for the three-input XOR function.
2. Draw a minimal-sized decision graph for the three-input XOR function.