**SECTION – B**

1. a) 1. b) PennyLane is a cross-platform Python library for quantum machine learning, automatic differentiation, and optimization of hybrid quantum-classical computations. Qiskit is an open-source framework for quantum computing. Qiskit requires less theoretical information to be used, while Pennylane demonstrates superior performance in terms of execution time. Although both frameworks exhibit variances, experiments reveal that Qiskit consistently yields superior classification accuracy compared to Pennylane when training classifiers with quantum kernels.

2. a) Quantum gates are building part of the quantum circuits. The most common gates being X, Y and Z gates each of which represents rotation of vector 180 degrees about x, y and z axes respectively in the bloch sphere. Unlike many classical logic gates quantum gates are reversible. Classical logic gates accept binary logical objects called bits while quantum gates accept quantum logical gates called qubits.

c) In quantum computing, **Grover's algorithm**, also known as the **quantum search algorithm**, is a quantum algorithm for unstructured search that finds with high probability the unique input to a black box function that produces a particular output value, using just O(N) evaluations of the function, where N is the size of the function's domain.

An example of such a problem is finding a specific card in a shuffled deck of N cards. Classically this can only be done by searching the deck of cards one by one, in which case you will need N steps (i.e. N evaluations of the Oracle representing the inspection of cards). Grover's algorithm requires only O(N) evaluations of the Oracle. The caveat however is that the probability of finding the right answer is not 100%, as will become clearer from the steps in the algorithm.