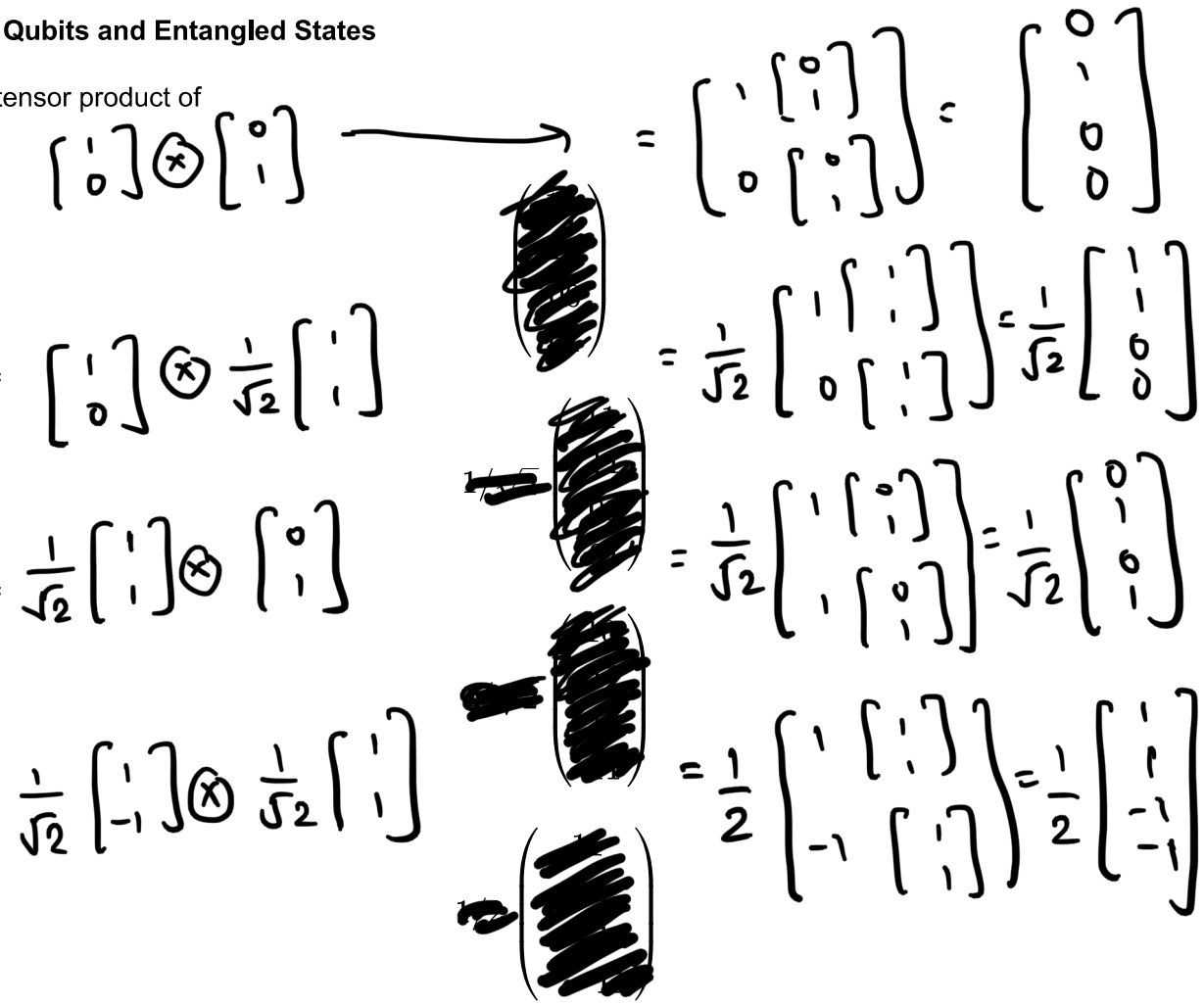
2.2 Multiple Qubits and Entangled States

1) Write the tensor product of

- |0>|1> =
- |0>|+> =
- |+>|1> =
- |->|+> =



2) Write the state: |ψ⟩ = $1/\sqrt{2}$ (|00> + i|01>) as two separate qubits.

Ans. $1/\sqrt{2}$ (|00> + i|01>) = |0> $\otimes$ $1/\sqrt{2}$ (|0> + i|1>)

3) Calculate the single qubit unitary (U) created by the sequence of gates: U = XZH. Use Qiskit's unitary simulator to check your results.

(**Refer pdf1 file attached**)

4) Create a quantum circuit that produces $1/\sqrt{2}$ (|01> + |10>). Use the statevector simulator to verify your result.

(**Refer pdf1 file attached**)

5) The circuit created above transform the state |00> to $1/\sqrt{2}$ (|01> + |10>), calculate the unitary of this circuit using Qiskit's simulator.

(**Refer pdf1 file attached**)

In [ ]: