## Quiz 4

| Name: | : Date:   | I participated today:          |
|-------|---|--------------------------------|
| 1.    | What size matrix is required to fully describe the transformation a $quantum n$ -qubit system?  | uantum operation has on an     |
|       | <b>=</b>  |                                |
| 2.    | When applying controlled Z, does it matter which qubit is the target other words, does there exist some state $ \psi_1,\psi_2\rangle$ such that $CZ(\psi_1,\psi_2)$ same state as $CZ(\psi_2,\psi_1)$ ? |                                |
| 3.    | implement any possible Boolean function. For example, the sets $\{AN\}$   | $\{D,NOT\}$ and $\{NAND\}$ are |
|       | both functionally complete. Does there exist a functionally complete  | set of quantum logic gates?    |
| 4.    | In the superdense coding protocol, the sender seems to encode two single qubit. How is this possible?   | bits of information into a     |
|       |   |                                |