

Exercise 6

Task 1. Answer the following questions and explain your answers.

- (a) What is a qubit, and what is quantum state?
- (b) What is an entangled state? Is $\alpha\gamma|00\rangle + \alpha\lambda|01\rangle + \beta\gamma|10\rangle + \beta\lambda|11\rangle$ entangled?
- (c) What is the main property of the operators used in quantum computing?
- (d) What is a universal gate set? How is it related to arbitrary gates?
- (e) What is a full projective measurement in the standard base, and how does it differ from the general notion of a projective measurement?
- (f) What is the principle of deferred measurement?