Quantum information: examination topics

Basic (complex and projective) linear algebra is assumed and can be examined in any topic.

1. Deutsch-Jozsa algorithm
2. Reversible logical circuits and the quantum representation of Boolean functions
3. Universal set of gates
4. Characters and the discrete Fourier transform (the circuit over $\mathbb{Z}_2^n$)
5. Shor algorithm overview
6. The quantum Fourier transform circuit over $\mathbb{Z}_n$
7. Representation of a qubit and of unitary operators using quaternions
8. Unitary transformation of a qubit as a Bloch sphere rotation
9. AXBXC decomposition of a unitary operator and its role in the universal set of gates
10. Density operators and the quantum entropy
11. Subsystem of a composite system and its description
12. BB84 protocol and uncertainty principle