



Certified Quantum Engineering Professional (CQEP)

Exam Objectives CQEP-001

About the exam

Item	Detail
Level	Intermediate
Number of questions	80. A performance-based exam: each form can carry up to 5 to 12 performance-based questions alongside the multiple-choice questions.
Delivery model	Computer adaptive in 3 stages of 28, 26, 26 questions. Your score on each stage selects the difficulty of the next, so no two candidates sit the same paper.
Time limit	120 minutes
Scoring	You need a score of 700 out of 900 to pass. Results are reported on a scale of 100 to 900, and 700 corresponds to answering 72% of the exam correctly. Harder questions carry more weight, so a score means the same thing on any route. Multiple-response items and PBQs are scored all or nothing.
Delivery	Online, fully proctored (webcam, microphone and screen).
Prerequisites	No formal prerequisite. Candidates do best with linear algebra at first-year level, comfort reading code in any language, and 60 to 90 hours of study.
Retakes	No waiting period after a failed first attempt. Candidates pay the exam price each time they attempt the exam. See the CertLabz Certification Retake Policy at certlabz.com/certification-retake-policy.html
Validity	3 years. Renew with 50 CEUs per cycle and the \$35 annual continuing-education fee, or by passing the current exam.
Language	English
Exam voucher	\$149 for one sitting, valid 12 months. Bundles add the study guide ebook and the All Access plan.

Domain weights

Domain	Questions
D1 Quantum Information Foundations (20%)	16

D2 Gates, Circuits and Measurement (22%)

	18
D3 Algorithms and Complexity (20%)	16
D4 Hardware, Noise and Error Correction (15%)	12
D5 Programming, Simulation and Hybrid Workflows (10%)	8
D6 Post-Quantum Security and Business Adoption (13%)	10
Total (100%)	80

Objectives by domain

Each objective may appear as knowledge, a scenario to judge, a circuit to trace or assemble, or a number to compute. Each form can carry up to 5 to 12 performance-based questions: drag-and-drop matching, sequencing and table completion, drawn fresh each attempt. The exam does not test any vendor's SDK syntax.

D1 Quantum Information Foundations

20% 16 questions

- D1.1 Qubits, superposition and the Bloch sphere
- D1.2 Measurement, probability amplitudes and the Born rule
- D1.3 Entanglement, Bell states and non-locality
- D1.4 No-cloning, teleportation and superdense coding
- D1.5 Density matrices and mixed states
- D1.6 Holevo bound and what n qubits can carry

D2 Gates, Circuits and Measurement

22% 18 questions

- D2.1 Single-qubit gates: X, Y, Z, H, S, T and rotations
- D2.2 Two-qubit gates: CNOT, CZ, SWAP, Toffoli and controlled phases
- D2.3 Reading and tracing circuit diagrams
- D2.4 Universal gate sets and the Clifford group
- D2.5 Measurement in X, Y and Z bases and mid-circuit measurement
- D2.6 Phase kickback, uncomputation and circuit depth

D3 Algorithms and Complexity

20% 16 questions

- D3.1 Deutsch-Jozsa, Bernstein-Vazirani and Simon
- D3.2 Grover search and amplitude amplification
- D3.3 Quantum Fourier transform and phase estimation
- D3.4 Shor factoring and period finding
- D3.5 Variational algorithms: VQE, QAOA and barren plateaus
- D3.6 BQP, HHL caveats and the limits of quantum speedup

D4 Hardware, Noise and Error Correction

15% 12 questions

- D4.1 Superconducting, trapped-ion, photonic and neutral-atom platforms
- D4.2 T1, T2, gate fidelity and coherence budgets
- D4.3 Error mitigation: zero-noise extrapolation and readout calibration
- D4.4 Stabilizer codes, surface code distance and thresholds
- D4.5 Magic states, transversal gates and leakage
- D4.6 Transpilation, routing and the NISQ era

D5 Programming, Simulation and Hybrid Workflows

10% 8 questions

- D5.1 Statevector, density-matrix, tensor-network and stabilizer simulators
- D5.2 Shots, sampling error and result interpretation
- D5.3 Parameterized circuits and batched cloud execution
- D5.4 OpenQASM and vendor-neutral interchange
- D5.5 Noise models and reproducibility practice
- D5.6 Annealing versus the gate model

D6 Post-Quantum Security and Business Adoption

13% 10 questions

- D6.1 Harvest-now-decrypt-later and Mosca's inequality
- D6.2 NIST FIPS 203, 204 and 205: ML-KEM, ML-DSA and SLH-DSA
- D6.3 Hybrid TLS, signature migration and crypto agility
- D6.4 QKD and QRNG: what they do and do not solve
- D6.5 Evaluating advantage claims and choosing pilots
- D6.6 CNSA 2.0 and regulatory timelines

Continuing education

Renewal	Requirement
Validity	3 years from the date of issue
CEUs required per cycle	50
Annual CE fee	\$35
Alternative to CEUs	Pass the current version of the exam before the expiry date

Qualifying activities

Activity	CEUs
CertLabz labs, PBQs, courses and SkillTracker assessments	1 CEU per hour, up to 25 per cycle
Other industry certifications earned or renewed	10 to 25 each, depending on level
Conferences, webinars and training	1 CEU per hour, up to 20 per cycle
Quantum-related work experience	3 per year, up to 9 per cycle
Teaching, mentoring, publishing or open-source contributions	Up to 15 per cycle
College courses in quantum, physics, mathematics or computing	10 per completed course

CertLabz Certification Retake Policy

- **No waiting period after a failed first attempt:** If you fail your first attempt at any CertLabz certification examination, CertLabz does not require any waiting period between the first and second attempt.
- **Once you pass, you cannot resit the same exam code:** A candidate who has passed an exam and achieved a certification cannot take that exam again under the same exam code without prior consent from CertLabz. You will need to wait until a new series of the exam is published before attempting to recertify by examination.
- **Beta examinations, one attempt only:** A CertLabz beta examination may be taken one time by each candidate.
- **Violations invalidate the attempt:** A test found to be in violation of this policy will be invalidated, and the candidate may be subject to a suspension period. Repeat violators will be permanently banned from the CertLabz Certification Program.
- **Every attempt is paid for:** Candidates must pay the exam price each time they attempt the exam. CertLabz does not offer free retests or discounts on retakes.

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<https://certlabz.com/certifications/certified-quantum-engineering-professional.html>