Quiz 4 - Quantum Mechanics 1

Deadline: Friday 17 February 2023 (by 5pm)
Credits: 20 points
Number of questions: 10
Type of evaluation: Laboratory (LAB)

Instructions:
Write the correct answer to each question and/or briefly explain your answer.

*Obligatorio

1. Name: *

2. 1. (2 points) Explain: (i) what a Hilbert space is, and (ii) why it is relevant for Quantum Mechanics. *

3. 2. (2 points) Explain: (i) what a Hermitian operator is, and (ii) when a spectrum is said to be degenerate. *

4. 3. (2 points) Write down three differences between discrete and continuous spectra. *

5. 4. (2 points) Provide 2 examples of potentials that allow discrete spectra, and 2 examples of potentials that allow continuous spectra. *

6. 5. (2 points) What are the key properties that eigenfunctions need to have to ensure they are associated with real quantum particles? *

7. 6. (2 points) Explain in your own words what the generalised statistical interpretation of Quantum Mechanics tells us. *

8. 7. (2 points) Provide two differences between compatible and incompatible observables. *

9. 8. (2 points) What does the energy-time uncertainty principle tell us about a quantum system? *

10. 9. (2 points) What do vectors and operators represent in the formalism of Quantum Mechanics? *

11. 10. (2 points) Indicate two differences between 'bras' and 'kets' in Dirac notation. *