Question 1

Many particles are each in the same stationary state

$$\Psi(x,t) = \psi(x)e^{-iEt/\hbar}.$$

Suppose that one position measurement is made on each particle.

Which of the following is true?

1. The statistical outcomes of the measurements do not depend on the time at which the measurements are made.
2. The statistical outcomes of the measurements do not depend on the time at which the measurements are made but only if they are done at the same time for each copy.
3. The statistical outcomes of the measurements do depend on the time at which the measurements are made.

Question 2

Many particles are each in the same stationary state

$$\Psi(x,t) = \psi(x)e^{-iEt/\hbar}.$$

Suppose that one momentum measurement is made on each particle.

Which of the following is true?

1. Both $\langle p \rangle$ and Δp depend on time.
2. Neither $\langle p \rangle$ and Δp depend on time.
3. $\langle p \rangle$ depends on time, Δp does not depend on time.
4. $\langle p \rangle$ does not depend on time, Δp depends on time.