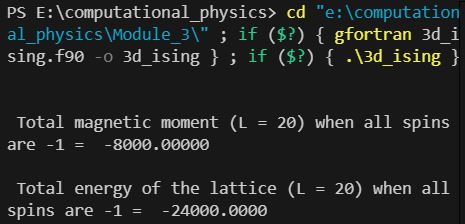
**Module 3**

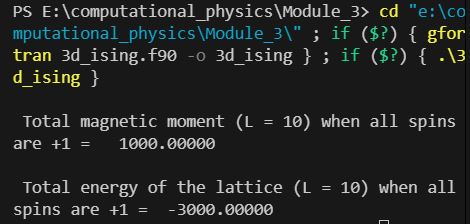
Submitted by: Anirban Nath

Register number: 20242019

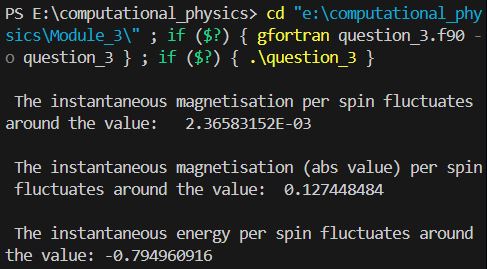
**Question 1.**

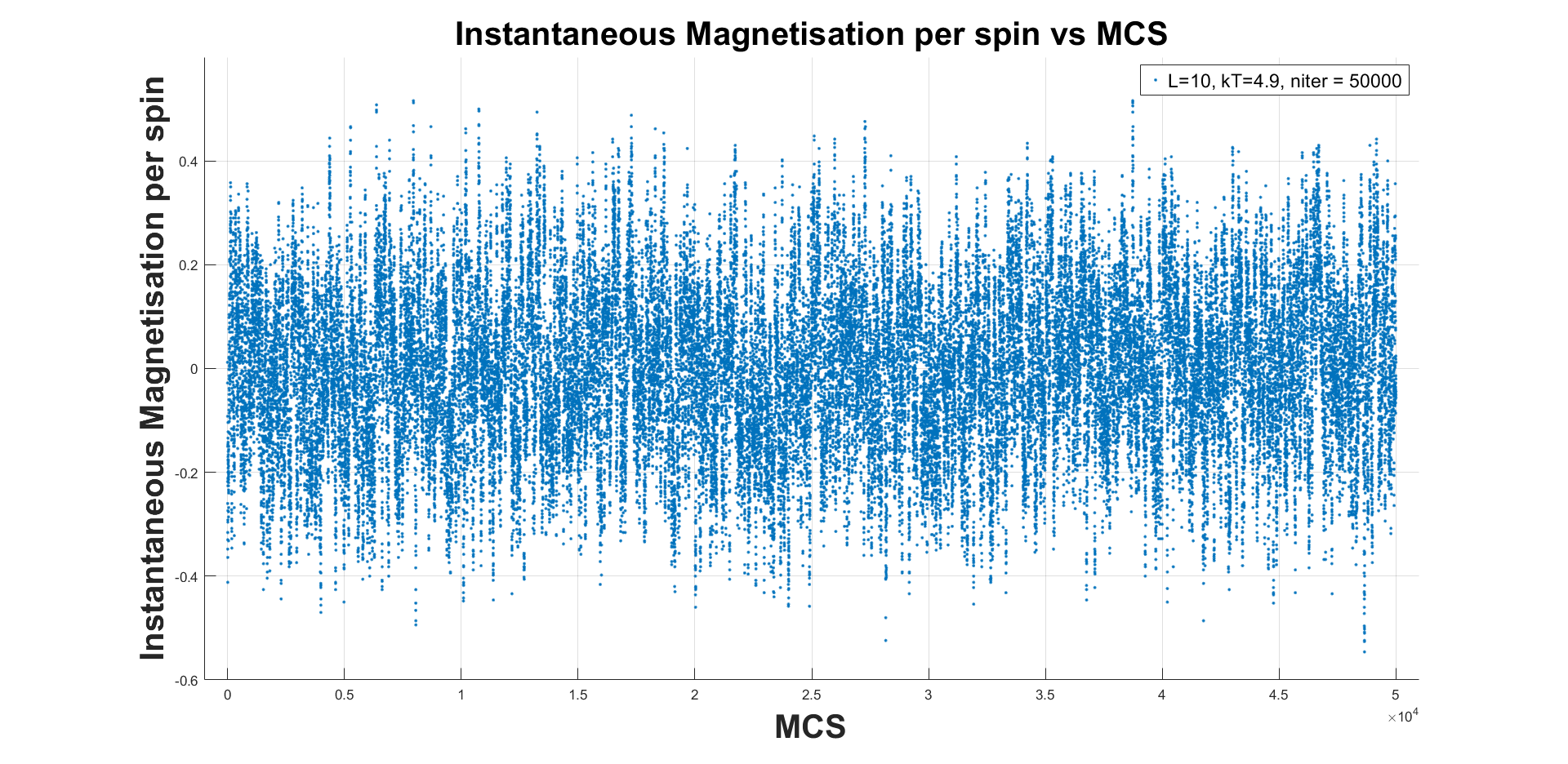
****

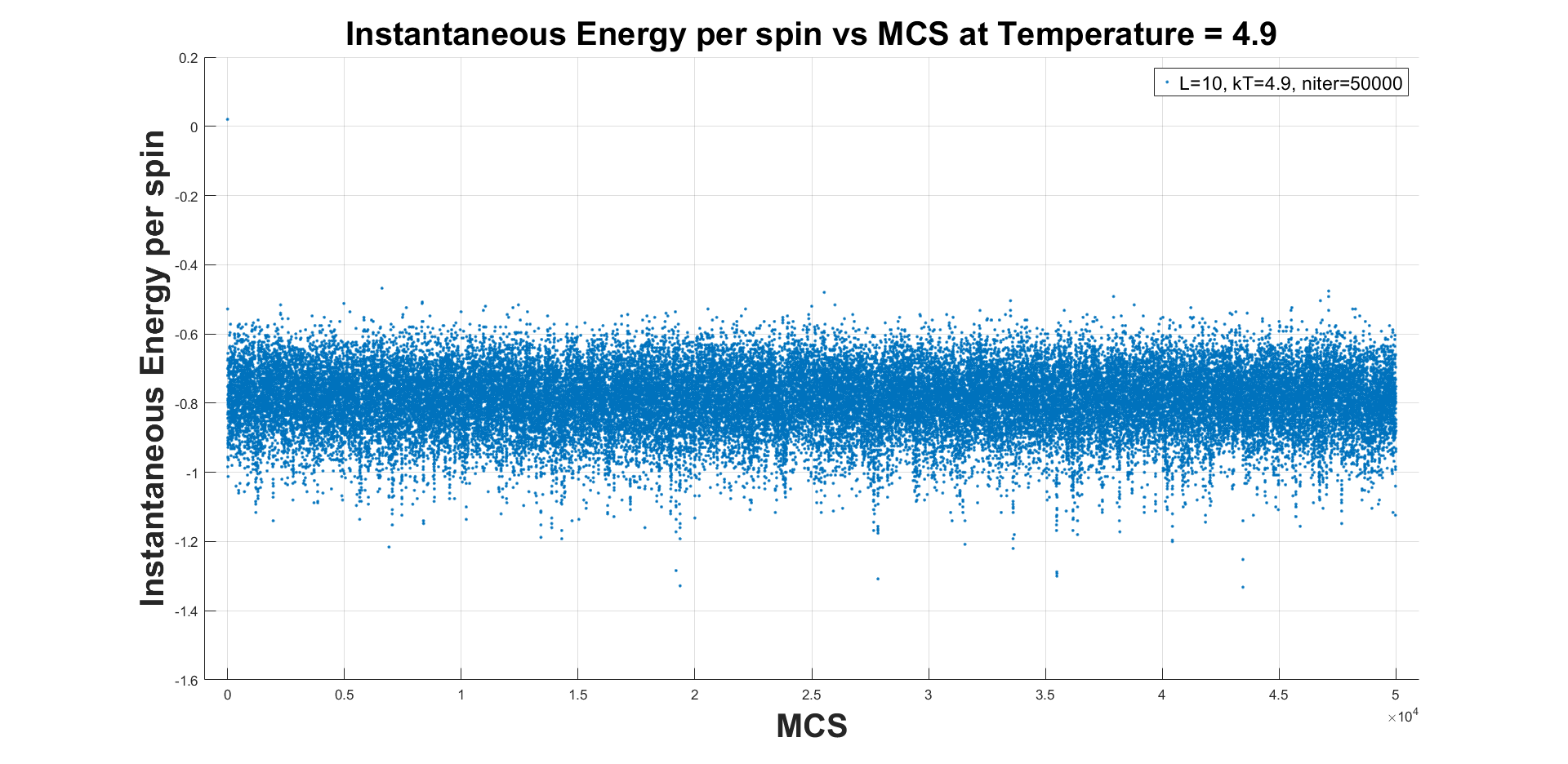
**Question 2.**

****

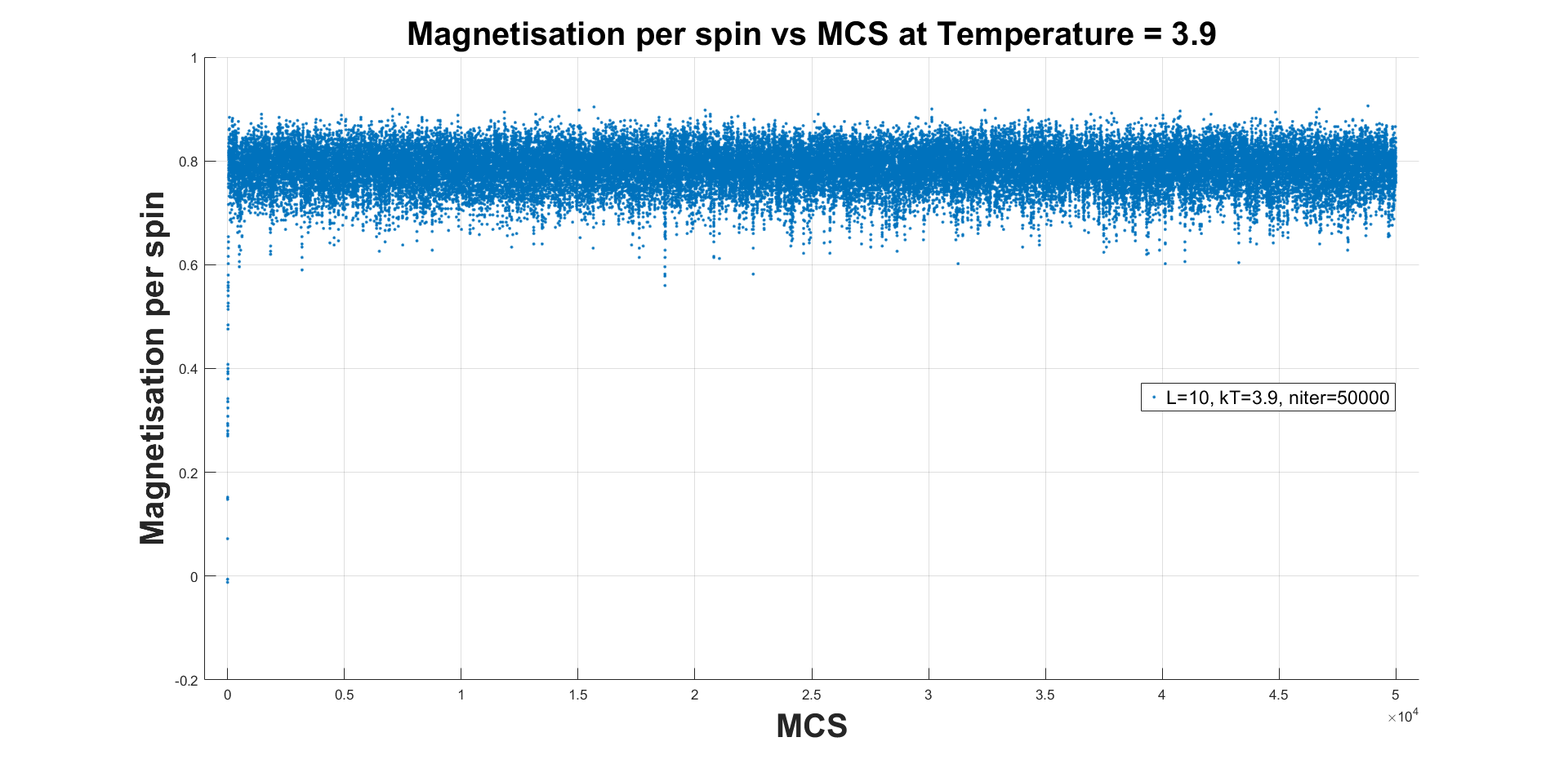
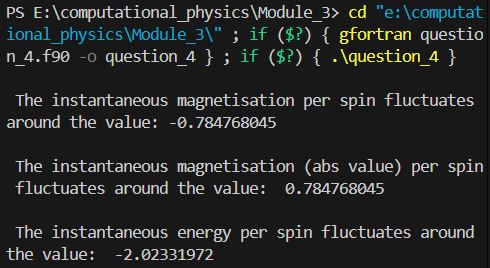
**Question 3.**

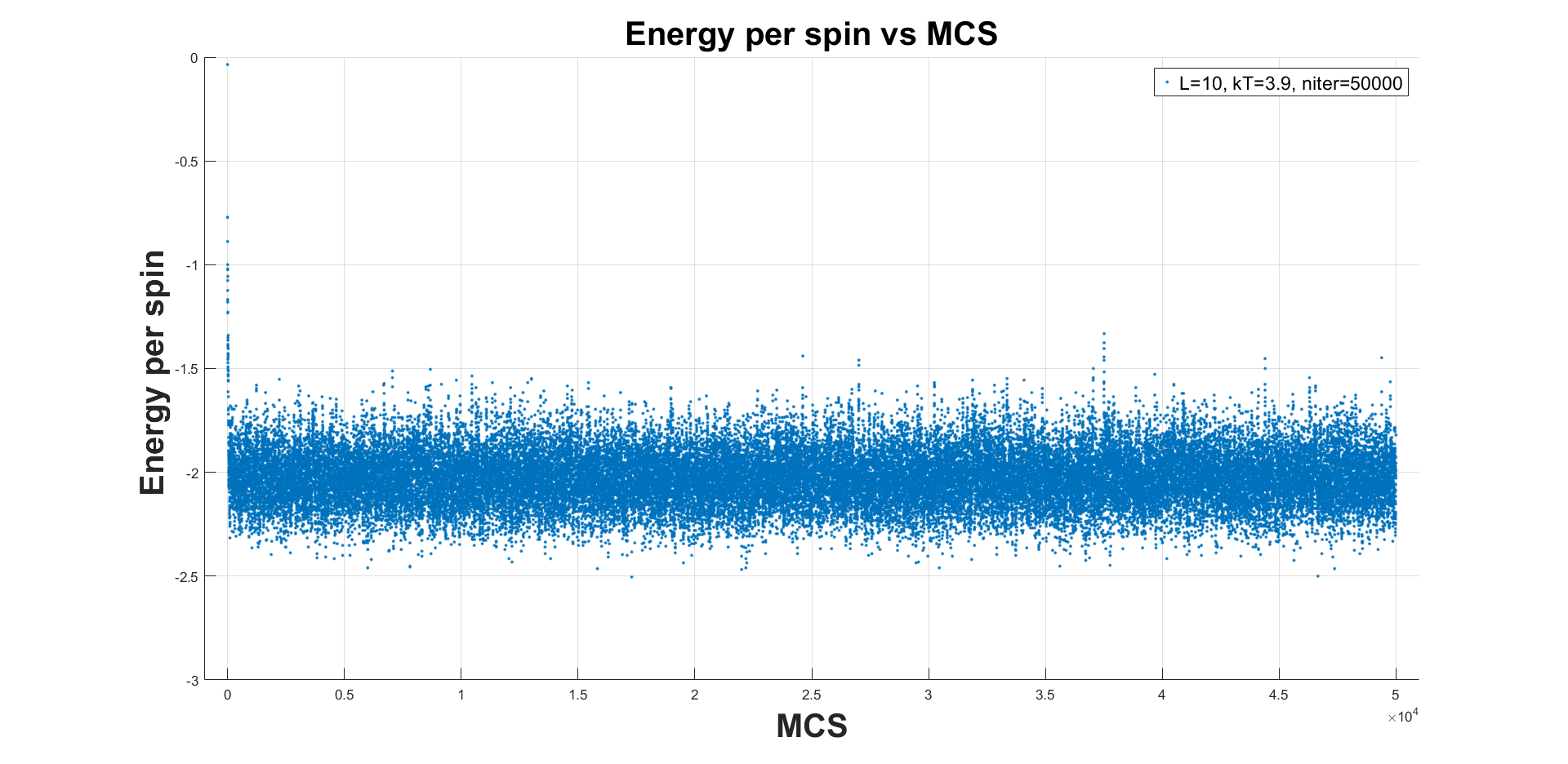
****



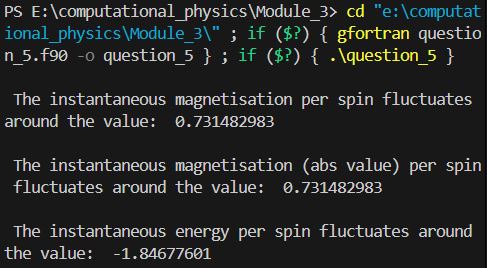
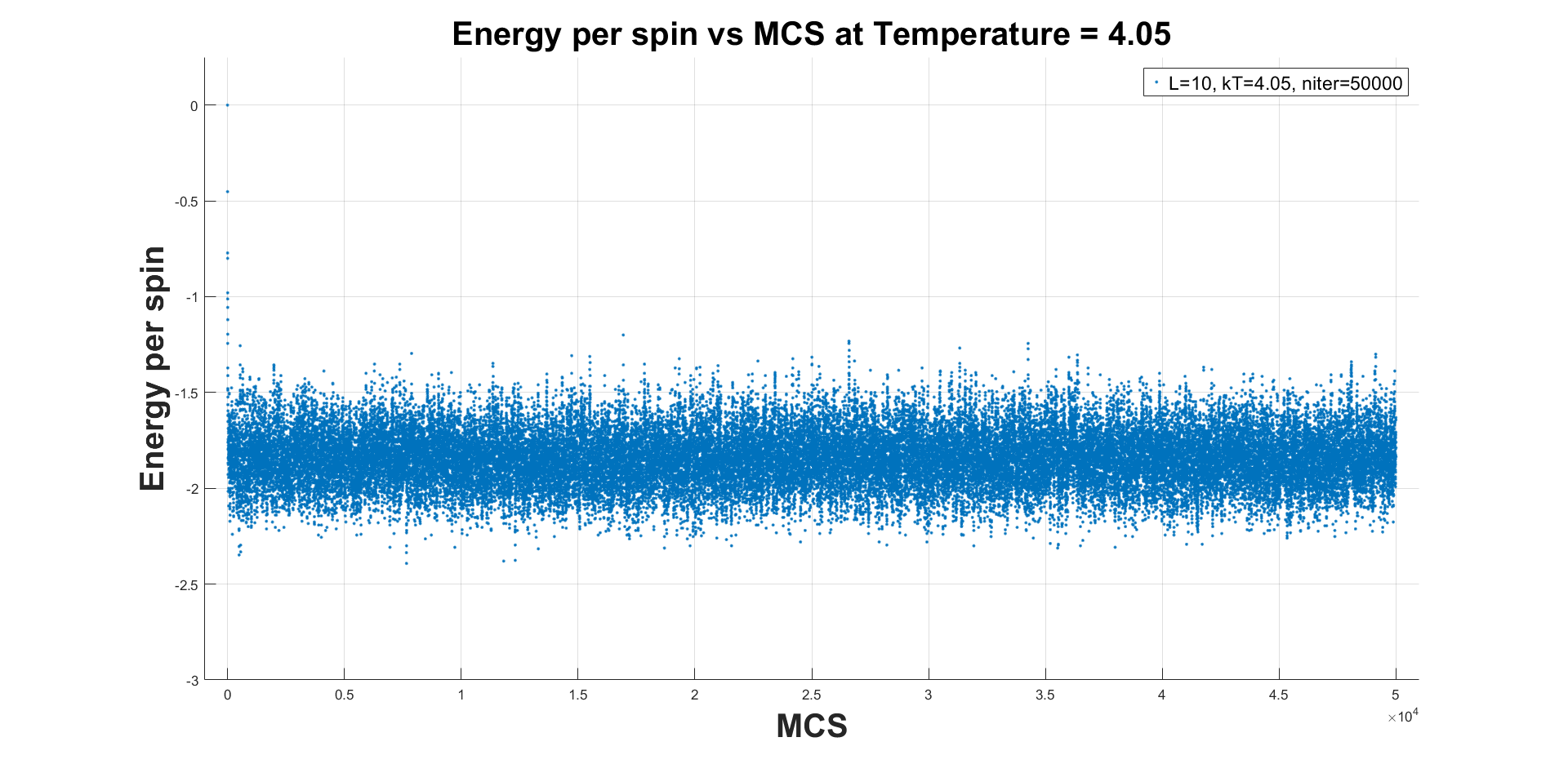
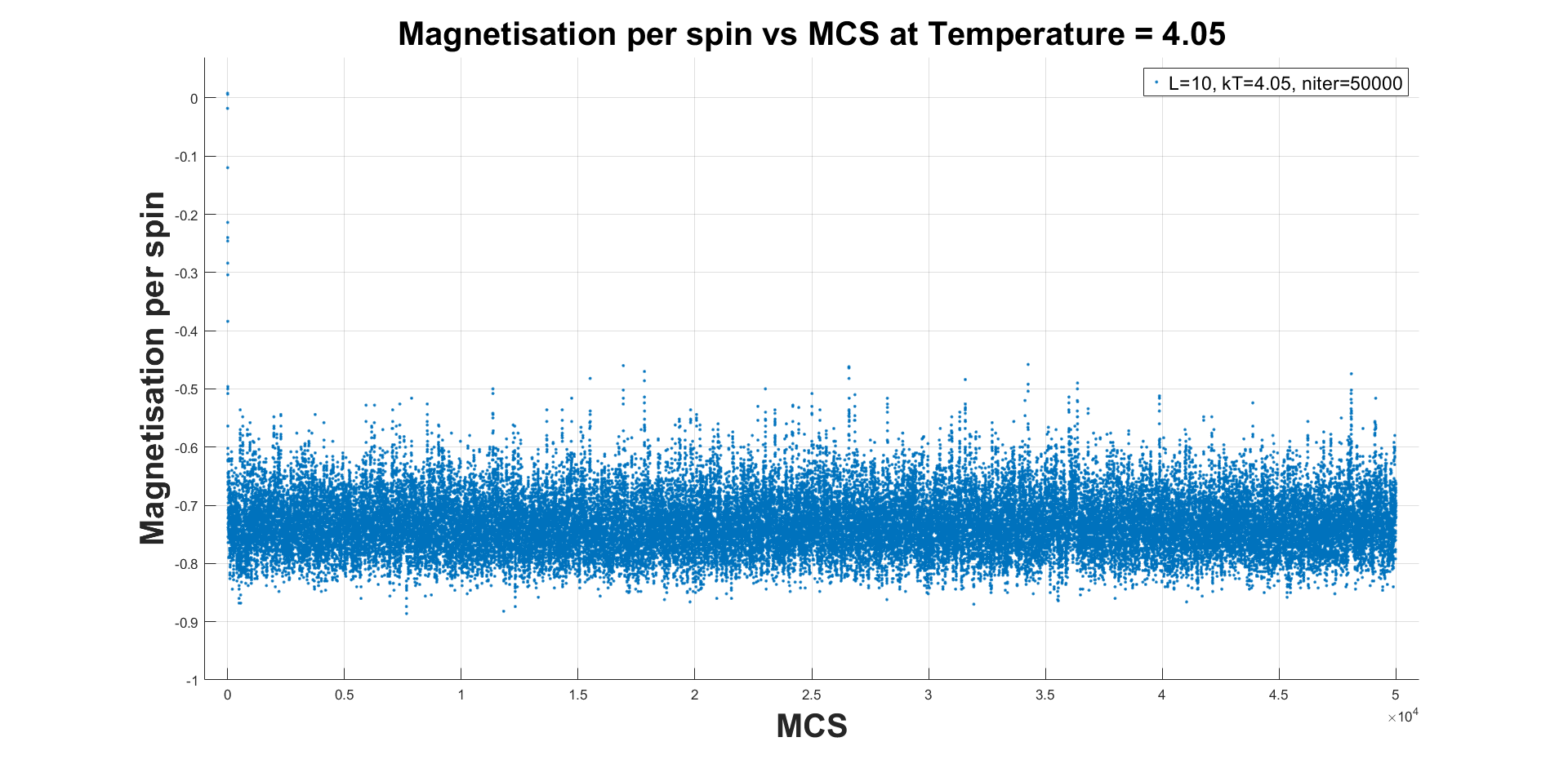


**Question 4.**

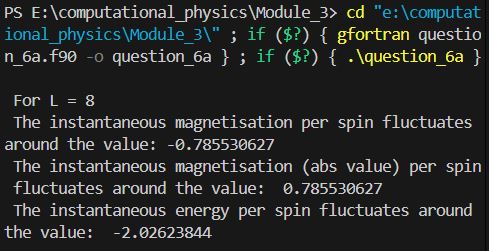
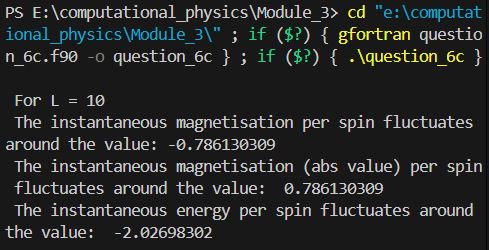
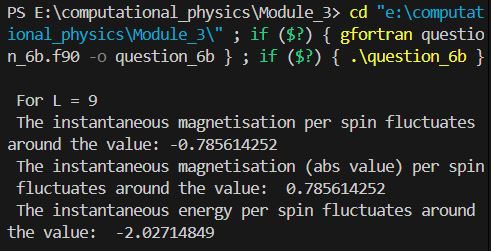


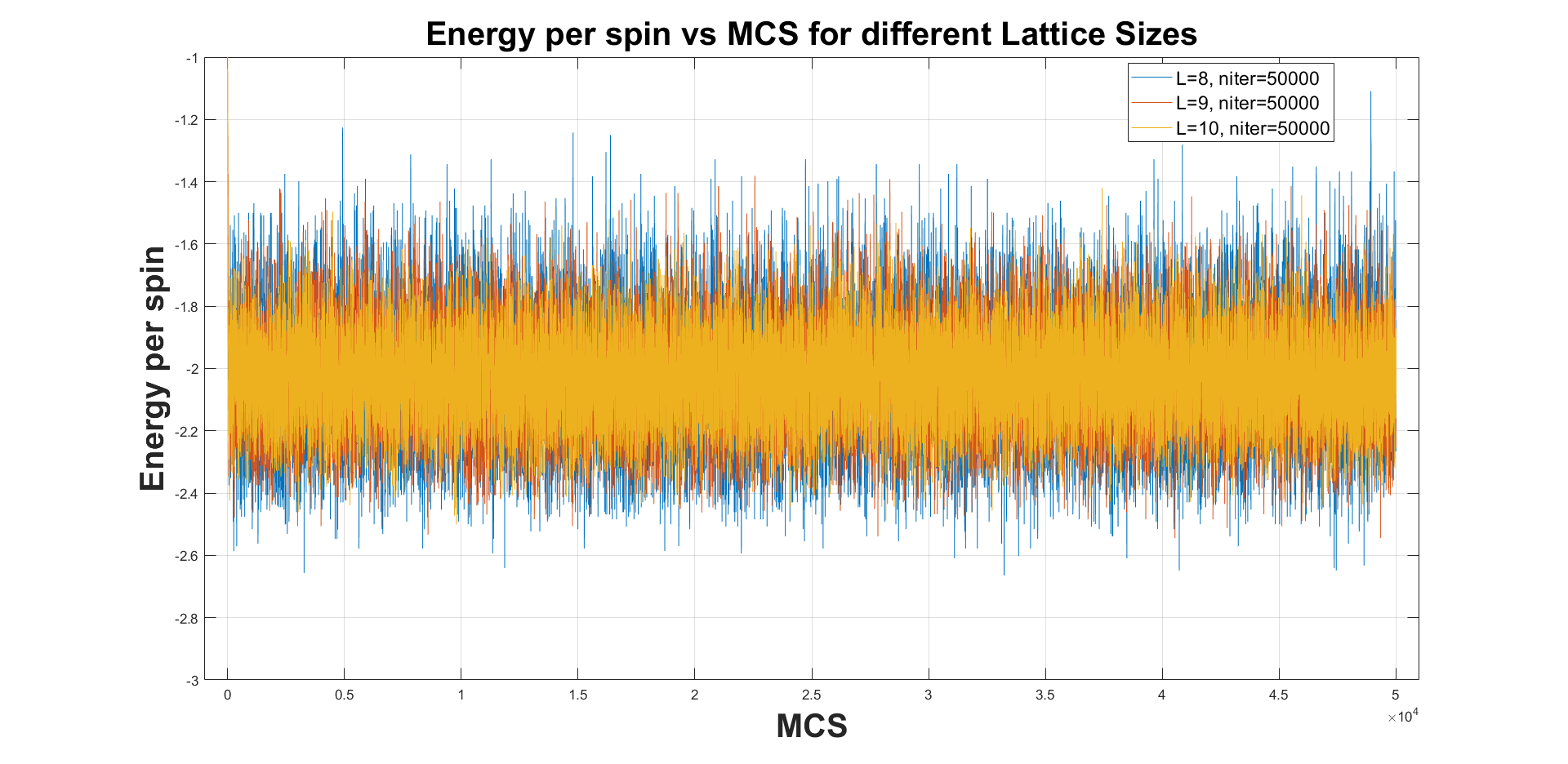
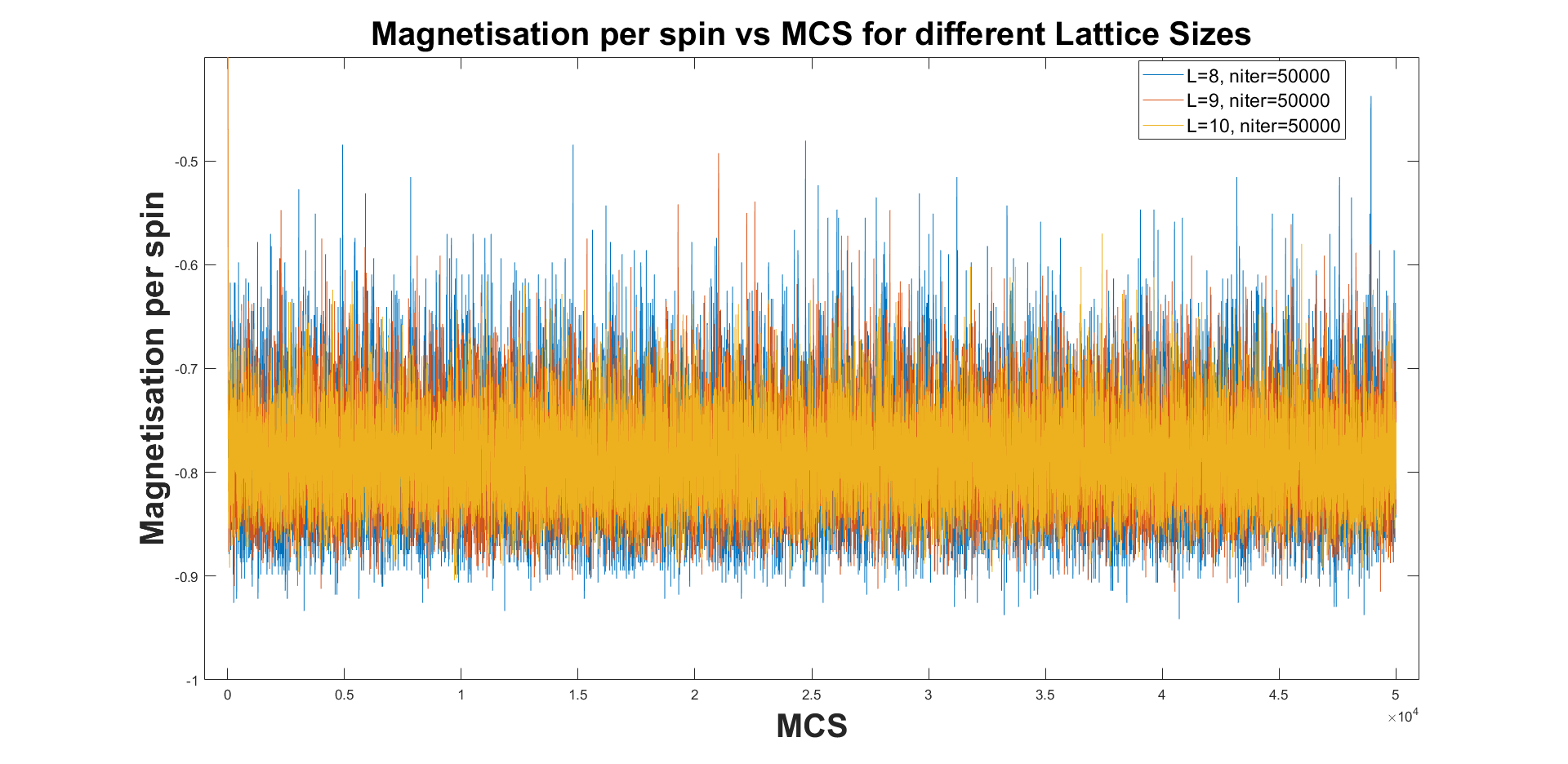


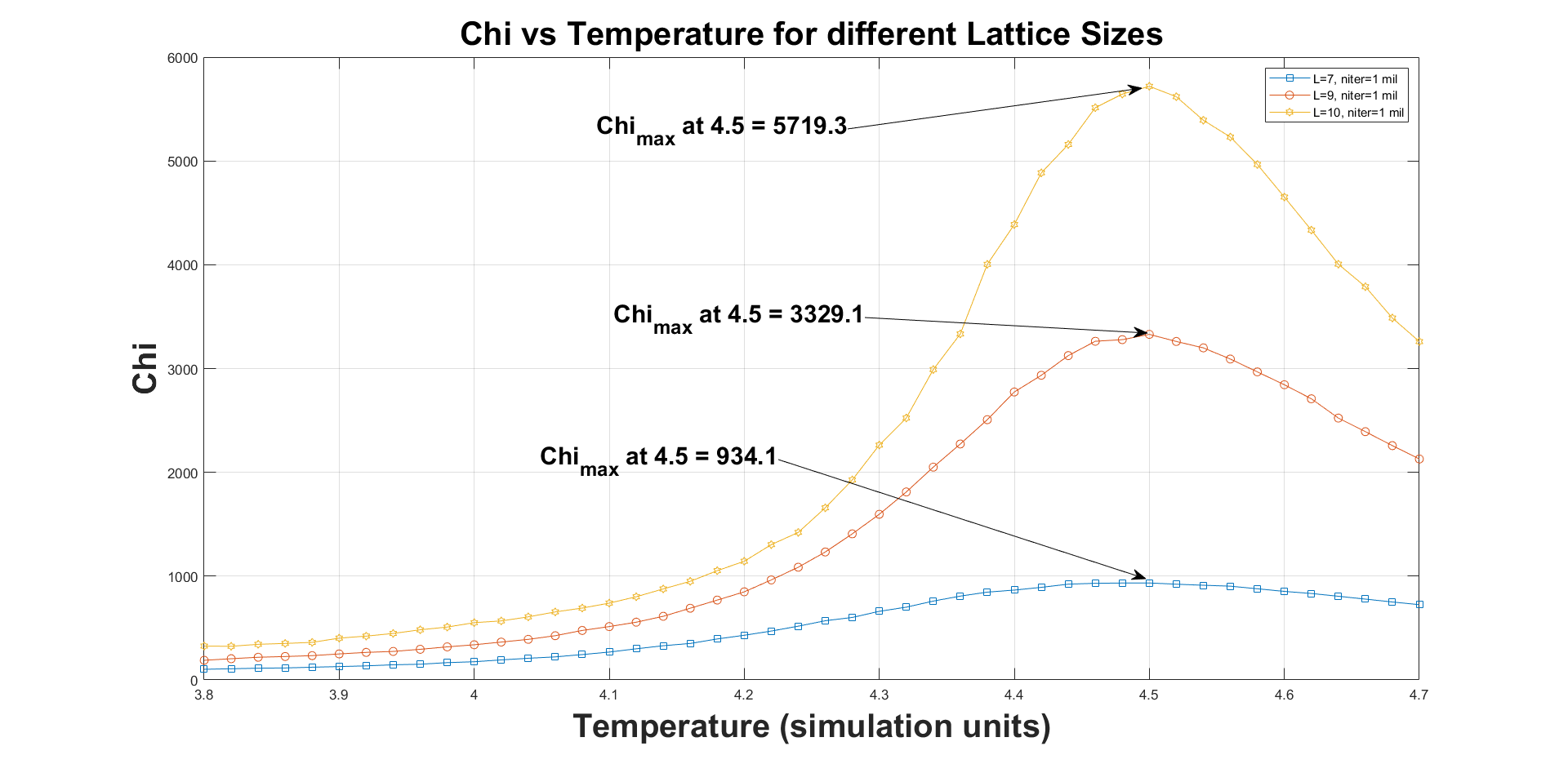
**Question 5.**

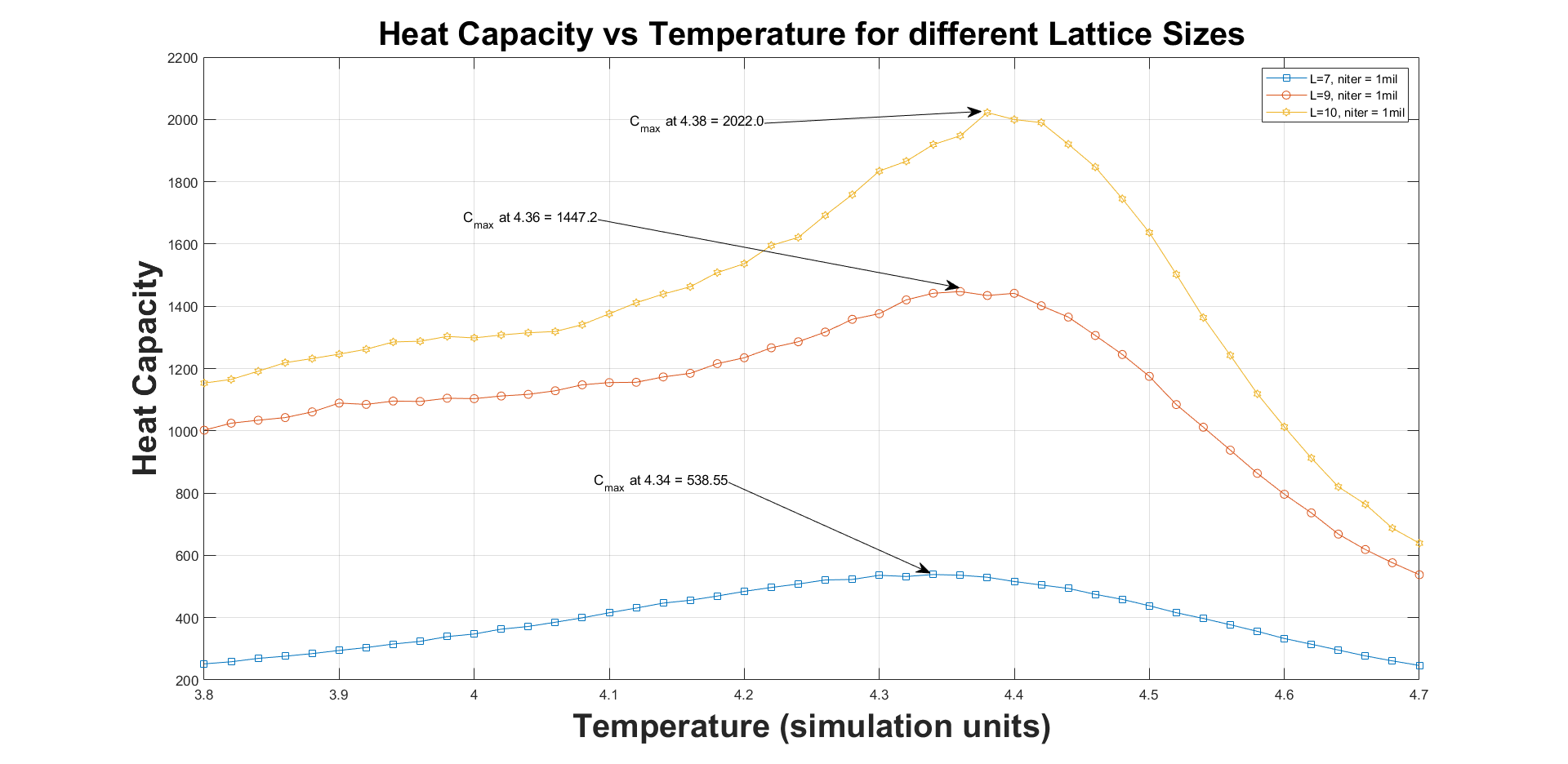
**Question 6.**





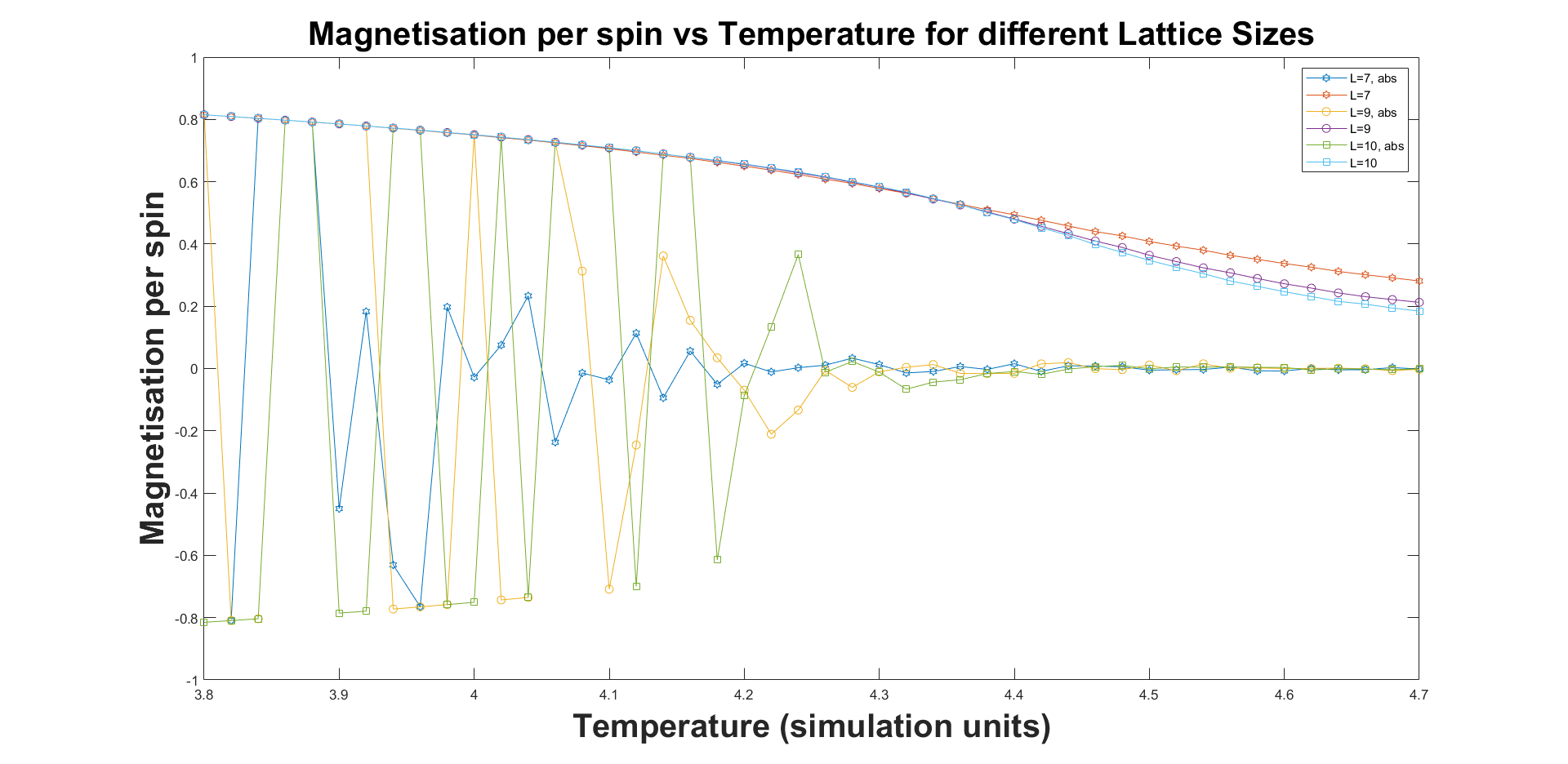
**Question 7.**

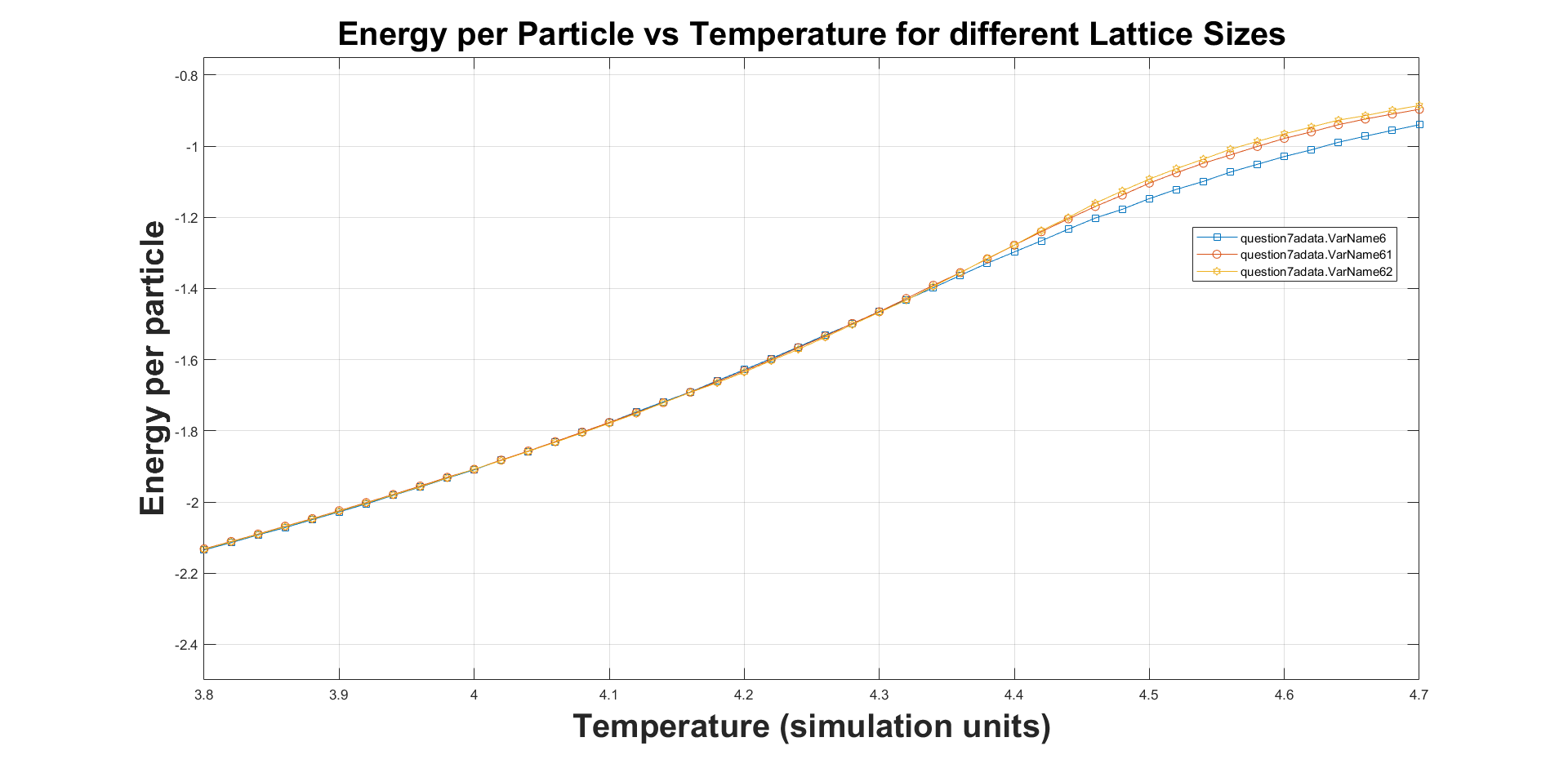
**Question 8. and Question 9.**

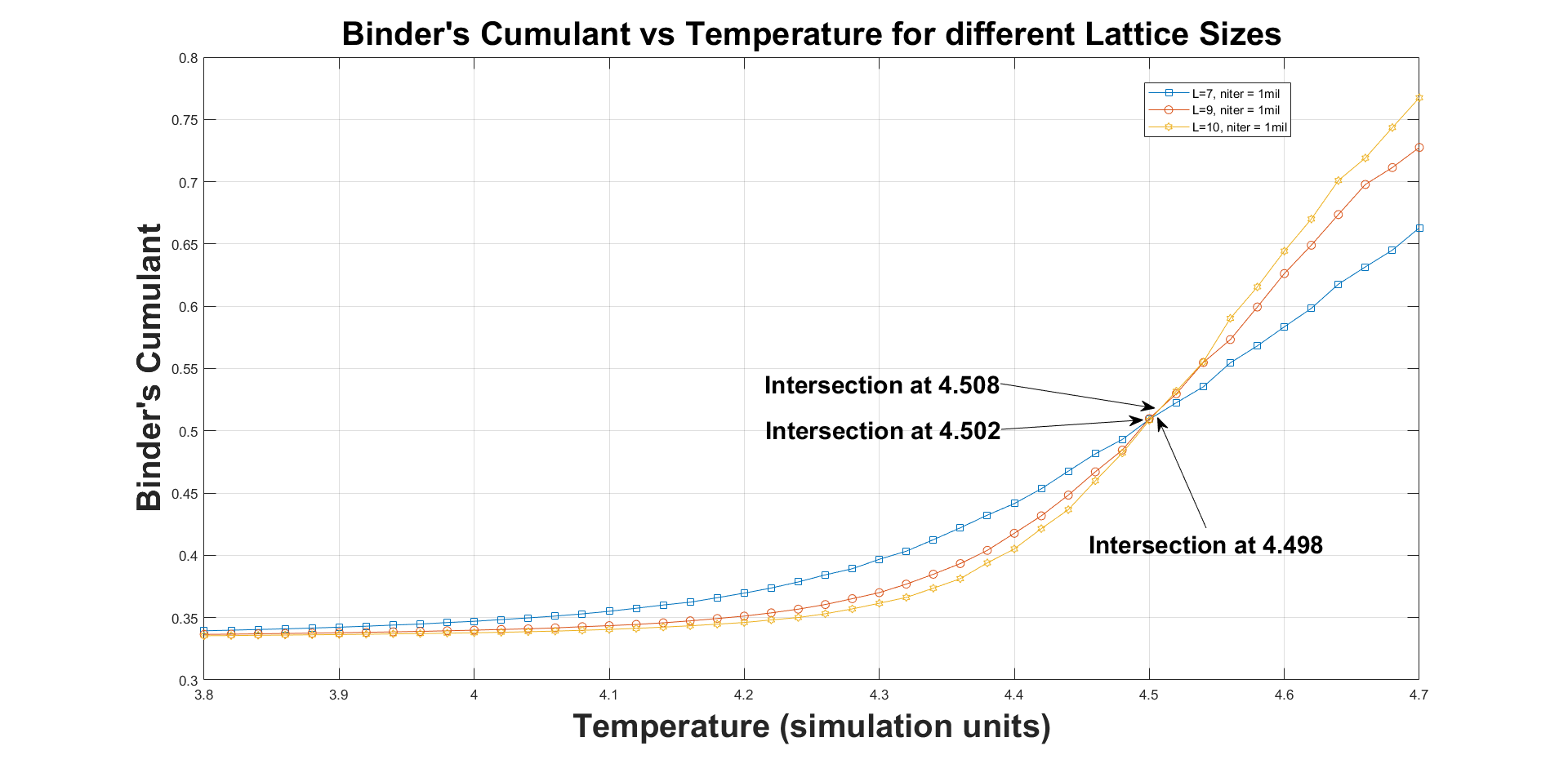


**Question 10.**

The value of Magnetisation per spin for L = 7 at temperature 3.8 is **0.8148**

****

**Extra Plots.**

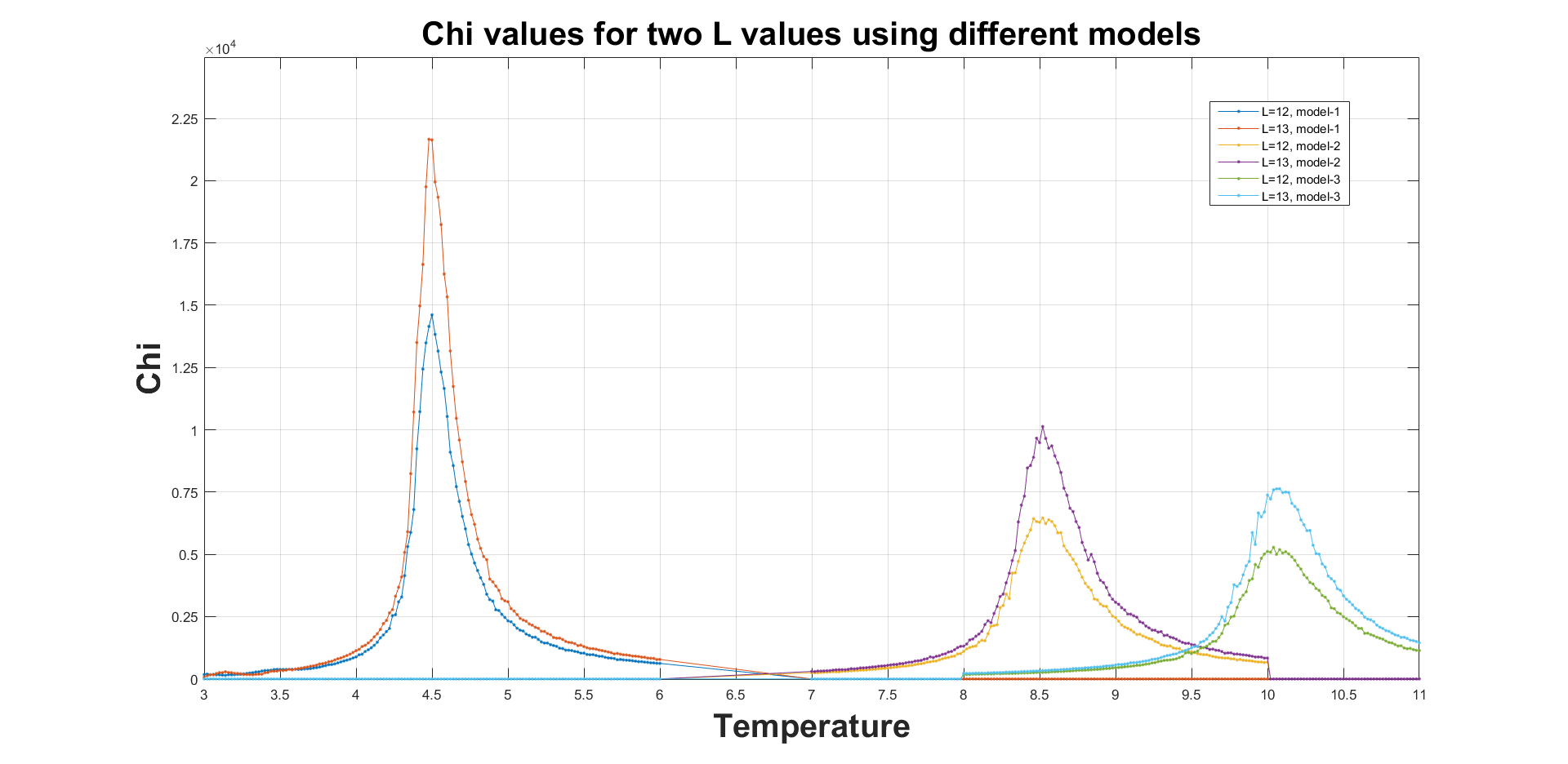
****

We see that the **Critical Temperature is 4.503** (in simulation units).

**Question 11.**

At equilibrium, we expect no net current in the system, i.e. no net transfer of particles from one state to another. Therefore, if 10 particles/sec are jumping from E5 to E10; then to make sure that no net current is there in the system, we need to have 10 particles/sec jumping from E10 to E5.

**Comparisons Between Model with upto 1st, 2nd and 3rd Nearest Neighbours**

****