Is lack of change in system and user time in between sampling periods a guarantee that deadlock has occurred? Explain briefly.

No, it's likely that none of the diner thread is scheduled because the last sample is taken, and this will happen more frequently when the gap between samples gets smaller.

What aspects of the system conditions would affect how long the sampling period should be to ensure a reliable assessment of whether deadlock has occurred or not.

Running time the processor has spent executing in user mode and running time the processor has spent executing in system mode.

Informal experimentation tends to show that larger values of ACTIVE_DURATION make deadlock less likely, as indicated by how many sampling periods it takes to occur, and that smaller values make it more likely. Try a few different values yourself and then discuss whether you think this is true, and why you think it might have the influence you observe.

After trying to set ACTIVE_DURATION to 20 and 2000, I concluded that the longer the ACTIVE_DURATION you set the less likely to have a deadlock. The longer ACTIVE_DURATION is, the less likely two philosophers' will collide with each other(picking up chopsticks) which cause deadlock to happen.