2. Three tasks, labelled T1; T2; T3, exist in a computer system. They enter the system at times t = 3ms; 2ms; 0ms respectively. The execution profile of each process is as follows:

- Task T1 executes normal code for 1ms, followed by the execution of a critical section for 3ms. After exiting the critical section, it executes for another 1ms. The deadline is 9ms.
- Task T2 executes normal code for 5ms. The deadline is 13ms.
- Task T3 executes normal code for 1ms, followed by the execution of a critical section for 2ms. The deadline is 15ms.
- The critical sections of tasks T1 and T3 are protected by a semaphore, S.
- The priority of the tasks is as follows: Priority(T1) > Priority(T2) > Priority(T3).

(a) Develop a schedule for the task set using a generic priority-based scheduling algorithm. Is there any task that misses its deadline? If so, which? [10]

(b) Develop a schedule for the task set using a generic priority-based scheduling algorithm extended with priority inheritance. Is there any task that misses its deadline? If so, which? [10]

(c) Using an appropriate example, explain one weakness of priority inheritance. [5]