Test Problems

1. Consider a set of four tasks. These tasks have their arrival times, execution times and dead-lines shown in the table below. The times are shown here as multiples of the time unit. The schedule is revised after arrival of every task or if 10 units of time have elapsed after the last revision. Prepare as earliest dead-line first schedule for this operational scenario.

Process	Time of arrival	Time required to execute	Time dead line of completion
U	0	25	35
V	20	25	120
W	25	10	75
X	40	30	100

2. A real-time system has three periodic events with periods 40, 80 and 120 ms. Explore and show the schedulability if each of the three kinds of events requires 15 ms of processing time. Assuming all events take equal time what is maximum time available for processing the events beyond which the system shall not be schedulable.
3. Suppose we have a real-time system which works satisfactorily with events happening at 30 and 50 units of time which require processing time of 10 and 5 units of time. Suppose there is a need to expand the scope of operations and one more event to be service. What is the maximum time that can be assigned to the new event without jeopardizing schedulability.
4. Consider the following set of tasks t1, t2, t3 having priorities t1>t2>t3. Consider the following schedule

    a. t3 starts at time 0sec, executes for 1sec, requests resource R and then runs for 3 secs and completes.
    b. t1 starts at time 2sec, runs for 1 sec, then requests resource R, and then runs for 4 secs and completes
    c. t2 starts at tie 3sec and runs for 5 secs.

    Draw the schedule using rate monotonic scheduling and show where the priority inversion occurs. Also use the technique used to avoid priority inversion and draw the new schedule.