

2a. (15 points) Real-time Scheduling: Rate Monotonic Scheduling (RMS)

$$RMS \leq \frac{e_i}{p_i} \leq n(2^{1/n} - 1)$$

Use the RMS schedulability analysis to check if the task set given is schedulable with RMS. If it is not schedulable under RMS, draw a timing chart to show where the first deadline miss occurs. Assume **pre-emptive** scheduling. Assume utility value for three tasks is 0.776 according to RMS. Assume all tasks arrive at $t=0$ and then periodically as given in the table.

100%

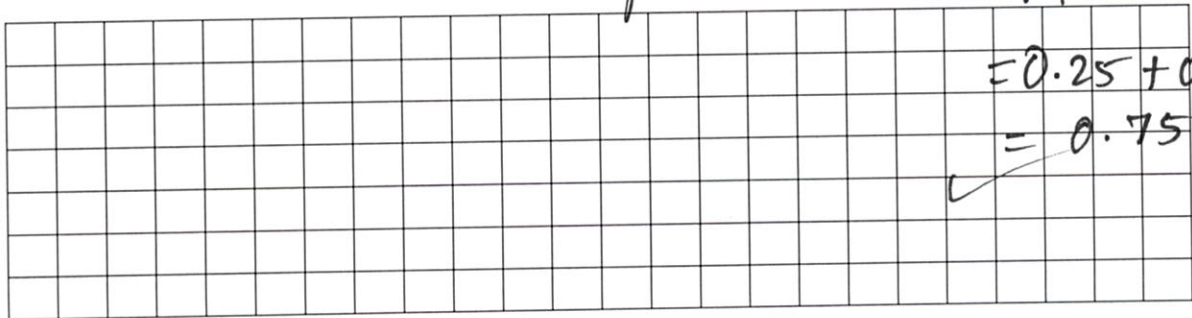
Task Set		
Task	Period	Execution time
1	4	1
2	10	2
3	6	3

$$U: \sum \frac{e_i}{p_i} \leq 1 \quad 100\%$$

$$U: \sum \frac{e_i}{p_i} \leq n(2^{1/n} - 1) \leq 0.779 \text{ for } n=3$$

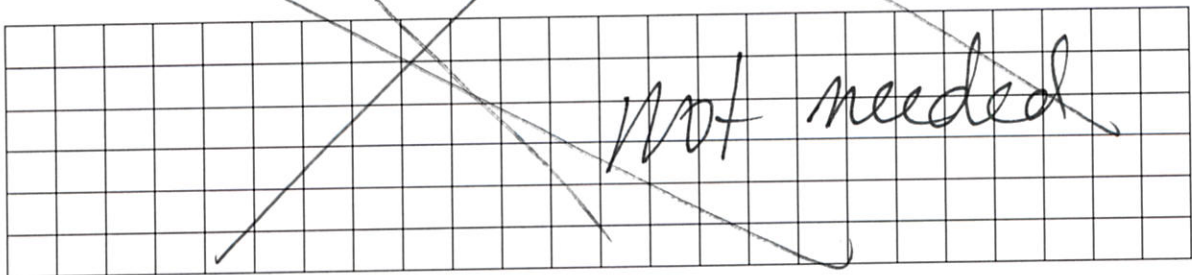
$$\frac{1}{4} + \frac{2}{10} + \frac{3}{6} = 0.25 + 0.2 + 0.5 = 0.95 \not\leq 0.779$$

$$\sum \frac{e_i}{p_i} \leq 0.779 \quad \frac{1}{4} + \frac{2}{10} + \frac{3}{9} = 0.25 + 0.2 + 0.3 = 0.75 \leq 0.779$$



2b. (10 points) Real-time Scheduling: Earliest Deadline Scheduling (EDS)

For the same task set given in Question 2a use the EDS schedulability analysis to check schedulability. Draw the timing chart for at least two cycles of all tasks. Assume **non-preemptive** since we are looking at only the earliest deadline.



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①

According to RMS
Priority

$t_1 \geq t_3 \neq t_2$
pre-emptive

