2000 Paper 3 Question 7

Operating System Functions

Why are the scheduling algorithms used in general-purpose operating systems such as Unix and Windows NT not suitable for real-time systems? [4 marks]

Rate monotonic (RM) and *earliest deadline first* (EDF) are two popular scheduling algorithms for real-time systems. Describe these algorithms, illustrating your answer by showing how each of them would schedule the following task set.

Task	*Requires Exactly*	*Every*
$\mathcal{A}$	2ms	10ms
$\mathcal{B}$	1ms	4ms
$\mathcal{C}$	1ms	5ms

You may assume that context switches are instantaneous. [8 marks]

Exhibit a task set which is schedulable under EDF but not under RM. You should demonstrate that this is the case, and explain why.
[Hint: consider the relationship between task periods.] [8 marks]