1st Semester Back Examination – 2016-17
REAL TIME SYSTEM
### BRANCH(S): CSE
Time: 3 Hours
Max Marks: 70
Q.CODE:Y971
Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 Answer the following questions: (2 x 10)
a) Differentiate between hard real-time system and soft real-time system.
b) What do you mean by the fail safe state of a system and what is its necessity?
c) Differentiate between aperiodic task and sporadic task with example.
d) Which of the two (planning based or the best effort) scheduler is more suitable for scheduling sporadic tasks. Justify your answer.
e) Justify earliest first deadline (EDF) algorithm is a dynamic priority scheduling algorithm.
f) Explain how can highest locker protocol overcome the possibility of deadlock occurrence in critical resource sharing.
g) What is a Byzantine clock? What problem arises due to its presence in clock synchronization?
h) Give two example applications where firm real-time communication support from the underlying network.
i) Is 2PL-WP protocol used in concurrency control in real-time databases is free from deadlocks.
j) Explain a traffic specification model that can satisfactorily used to specify burst traffic.

Q2 a) Draw the Extended finite state diagram of a bank ATM. The diagram must show the time constraints between various events. (5)

b) Differentiate between table driven and cyclic schedulers. Explain various criteria to select the frame size in a cyclic scheduler. (5)

Q3 a) Determine whether the following set of periodic tasks is schedulable on a uniprocessor using deadline monotonic scheduling algorithm (DMA). Show all intermediate steps and draw the time diagram. All times are in msecs. Is it schedulable under RMA. (10)

Task	Start time	Processing time	Period	deadline
T1	20	25	150	140
T2	60	10	60	40
T3	40	20	200	120
T4	25	10	80	25

Q4   Explain different types of priority inversions occur in Priority scheduling protocol   (10)
during critical resource handling. Compute the different types of inversions that
each task might have to undergo in the worst case from the following task graph.
Consider the tasks are arranged with respect to the decreasing order of their
priority.
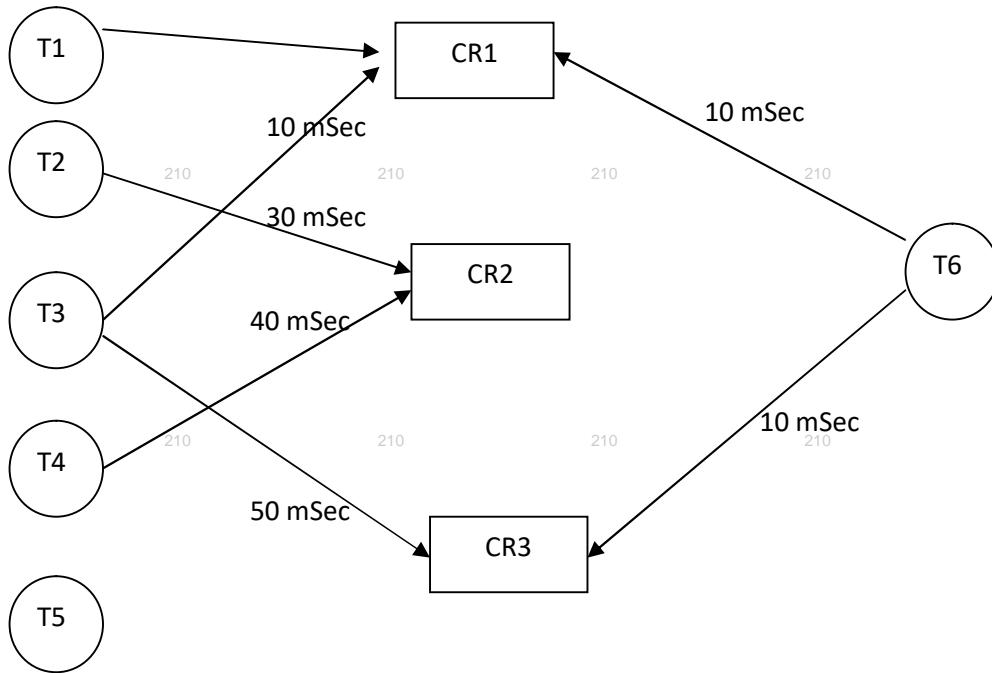
Q5   a)   Describe the focused addressing and bidding and the buddy schemes for running   (5)
a set of real-time tasks in a distributed environment. Compare the two schemes
with respect to communication overhead and scheduling proficiency.

    b)   Explain why algorithms that can be satisfactorily used to schedule real-time tasks   (5)
on multiprocessor is not suitable to schedule real-time tasks on distributed
systems and vice versa.

Q6   a)   Explain various features of a real-time operating system.   (5)
    b)   What is the role of concurrency protocol in a database? Is the traditional 2 phase   (5)
locking protocol for concurrency control suitable for real-time databases?

Q7   a)   What is soft real-time communication over LAN? Explain the fixed rate traffic   (10)
smoothing algorithm for supporting soft real-time communication over LAN.
Explain its disadvantages and how can we overcome it.

Q8   Write short notes on any two   (5 x 2)
   a)   POSIX
   b)   Chain blocking
   c)   Aperiodic server
   d)   CBR Vs VBR Traffic
   e)   Temporal data
   f)   Delay vs delay jitter
   g)   RETHER
   h)   RSVP