

B. TECH.**THEORY EXAMINATION (SEM-VIII) 2016-17
REAL TIME SYSTEM***Time : 3 Hours**Max. Marks : 100**Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.***SECTION – A**

1. Attempt all parts of the following questions: 10 x 2 = 20
- What do you mean by a real-time system?
 - Discuss issues in real-time system scenario.
 - What is an Embedded system? Differentiate between embedded system and real-time system.
 - Define TargetOS.
 - Compare open system compare with a close system?
 - What is the difference between hard and soft real-time communication supported by a network
 - Distinguish traffic shaping and policing.
 - What is meant by QoS routing?
 - Are all hard real-time systems usually are safety-critical in nature?
 - Scheduling decisions are made only at the arrival and completion of tasks in a non-pre emptive event-driven task scheduler. Justify your answer.

SECTION – B

2. Attempt any five of the following questions: 5 x 10 = 50
- What is the difference between a performance constraint and a behavioral constraint in real-time system?
 - Can we consider EDF as a dynamic priority scheduling algorithm for real-time tasks?
 - A real-time system consists of three tasks T₁, T₂, and T₃. Their characteristics have been shown in the following table.

Task	Phase (ms)	Execution Time (ms)	Relative Deadline (ms)	Period (ms)
T ₁	20	10	20	20
T ₂	40	10	50	50
T ₃	70	20	80	80

Suppose the tasks are to be scheduled using a table-driven scheduler. Compute the length of time for which the schedules have to be stored in the precomputed schedule table of the scheduler.

- Why are algorithms which can satisfactorily schedule real-time task on multiprocessors not satisfactory to schedule real-time tasks on distributed systems?
- What are the drawbacks in using Unix kernel for developing real-time applications?
- How does dynamically changing the priority levels of tasks property affect real-time systems?
- Discuss which category of concurrency protocol is best suited under what circumstance?
- Traditional 2PL protocol is not suitable for use in real-time databases. Why?

SECTION – C

Attempt any two of the following questions:

2 x 15 = 30

3. What are the distinguishing characteristics of periodic, aperiodic, and sporadic real-time tasks?
4. What is it required to synchronize the clocks in a distributed real-time system? Compare the advantages and disadvantages of centralized and the distributed clock synchronization.
5. What is the difference between synchronous and asynchronous I/O? Which one is better suited for use in real-time applications?