

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?

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