

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

- (a) What do you mean by a real-time system?
- (b) Discuss issues in real-time system scenario.
- (c) What is an Embedded system? Differentiate between embedded system and real-time system.
- (d) Define TargetOS.
- (e) Compare open system compare with a close system?
- (f) What is the difference between hard and soft real-time communication supported by a network
- (g) Distinguish traffic shaping and policing.
- (h) What is meant by QoS routing?
- (i) Are all hard real-time systems usually are safety-critical in nature?
- (j) Scheduling decisions are made only at the arrival and completion of tasks in a non-preemptive event-driven task scheduler. Justify your answer.

SECTION – B

2. Attempt any five of the following questions: 5 x 10 = 50

- (a) What is the difference between a performance constraint and a behavioral constraint in real-time system?
- (b) Can we consider EDF as a dynamic priority scheduling algorithm for real-time tasks?
- (c) 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.

- (d) Why are algorithms which can satisfactorily schedule real-time task on multiprocessors not satisfactory to schedule real-time tasks on distributed systems?
- (e) What are the drawbacks in using Unix kernel for developing real-time applications?
- (f) How does dynamically changing the priority levels of tasks property affect real-time systems?
- (g) Discuss which category of concurrency protocol is best suited under what circumstance?

- (h) Traditional 2PL protocol is not suitable for use in real-time databases. Why?



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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