Printed Pages : 2 Roll No. NCS082

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-pre emptive 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?

SECTION – C

Attempt any two of the following questions: **2 x 15 = 30**

3. What are the distinguishing characteristics of periodic, aperiodi, 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?