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Roll No.

B. TECH.
(SEM VI) THEORY EXAMINATION 2022-23
REAL TIME SYSTEM

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

(a) Differentiate between Real Time System and General Purpose Operating System.
(b) Define Embedded system. Give two examples of it.
(c) Differentiate between online and offline scheduling.
(d) Differentiate between periodic and aperiodic jobs.
(e) Define critical section problem with example.
(f) Explain controlling concurrent accesses to data objects.
(g) Define Controller Area Network (CAN) in embedded system.
(h) Describe service discipline categories: rate allocating and rate controlled.
(i) Differentiate between monolithic and microlithic approaches for implementing RTOS.
(j) Write the POSIX issues.

SECTION B

2. Attempt any *three* of the following: 10x3=30

(a) Explain Soft and Hard Real-Time Systems with suitable example.
(b) Explain with Weighted Round Robin with the help of an example. Also discuss the scenario of using this method.
(c) Discuss Priority-Ceiling Protocol and explain how it avoids Deadlocks?
(d) Analyze the real-time communication model diagram and further give an architectural overview.
(e) Describe the temporal data with an example. Give the characteristics of temporal data.

SECTION C

3. Attempt any *one* part of the following: 10x1=10

(a) Explain Precedence Constraints and Data Dependency with the help of an example.
(b) Explore the Reference Models for Real-Time Systems briefly with example.

4. Attempt any *one* part of the following: 10x1=10

(a) Show that periodic task (10,2), (15,5), and (25,9) are schedulable by the RMA.
(b) Draw the timing diagram for the T1 (2,0.9, 2) and T2 (5, 2.3, 5). Assuming that initial release time for both task is zero.

5. Attempt any *one* part of the following: 10x1=10

(a) Explain preemption ceiling protocols with examples.

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(b) Explain how Access Control in Multiple-Unit Resources is implemented.

6. Attempt any *one* part of the following: 10x1=10

(a) Discuss (RSVP) Resource-Reservation protocol by considering suitable example..

(b) Describe Medium Access Control Protocols for Broadcast Networks. Explain each of them in brief.

7. Attempt any *one* part of the following: 10x1=10

(a) Illustrate Real-Time Database Systems. Draw the general model of a Real-Time Database System. Explain Real-Time Transactions also.

(b) Discuss the need of concurrency control in Real Time System. What are the different approaches to control the concurrency? Explain any one of them.

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