

## CE7-R3: REAL TIME SYSTEMS

### NOTE:

1. Answer question 1 and any FOUR questions from 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

Time: 3 Hours

Total Marks: 100

1.
  - a) What does the term “real” in a real-time system signify? Explain, what you mean by a real-time system.
  - b) Explain, how a real-time database differs from a conventional database.
  - c) What is the Quality of Service (QoS) parameters underlying network for satisfactory operation in real-time application?
  - d) Explain, how a real-time operating system differs from a traditional operating system. Name a few real-time operating systems that are commercially available.
  - e) Why is it necessary to synchronize the clocks in a distributed real-time system? Discuss advantages of distributed clock synchronization schemes.
  - f) Draw and explain a basic model of a real-time system. Also mention its characteristics.
  - g) Explain different methods in software fault-tolerance techniques in a real-time system.  
(7x4)
  
2.
  - a) In real time computing, explain priority ceiling protocol for shared resources. Also what is importance of priority inheritance in real time system?
  - b) What is real-time CORBA Concepts? Explain any two specifications of CORBA which are required for implementing any real-time system.  
(10+8)
  
3.
  - a) What is Remote Procedure Calls (RPC)? Explain with example, how is it useful in protocol design?
  - b) What are the ACID rules in databases management systems? Explain different methods for concurrency control mechanism.  
(9+9)
  
4.
  - a) Real-time systems have to interact with real world entities. These interactions can get fairly complex. State different issues in real-time system design and explain those in details.
  - b) What is real-time scheduling? Explain taxonomy of real-time scheduling algorithms with examples.  
(10+8)
  
5.
  - a) What is significance of multiprocessor in real-time system? Also list what kind of potential difficulties observed with multiprocessor system?
  - b) What is importance of “kernel” in a real-time operating system?
  - c) State differences between Hard Real-time and Soft Real-time Systems.  
(9+5+4)

- 6.**
- a) Explain different types of threads which are commonly available for performance measurement in real-time systems.
  - b) List and explain capabilities of commercial real-time systems.
- (10+8)**

- 7.** Write **short notes** on the following:
- a) Security in Bluetooth system
  - b) CAN Bus
  - c) Priority-driven scheduler
- (6+6+6)**