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 are the five main steps that together constitute "task switching"?

b) Explain the necessity of precedence graph with an example.

c) What is the difference between RTOS and general-purpose operating systems?

d) Why is it difficult to predict response time in real time system? How do you overcome the problem?

e) How is wormhole routing used for packet transmission in a multihop network?

f) How does absolute and relative consistency differ from each other?

g) List atleast three uni-processor scheduling algorithms and explain then briefly.

                                                                          (7x4)

2.

a) What is Task scheduling? Explain it with a timing diagram.

b) What are the properties defining performance measures for real time system?

c) What are the components of a real time system? Give a diagrammatic representation.

                                                                          (8+4+6)

3.

a) How faults are classified and explain them with a state diagram.

b) How can a real time system be kept running despite the failure of some of its parts? Give al least four methods briefly.

c) List out the timing specification a good real-time language should hold.

d) Give a note on advantages and disadvantage of hardware synchronization.

                                                                          (6+4+4+4)

4.

a) Which is the protocol widely sued for single channel broadcast network and the bus and ring topology? Explain and draw the algorithm of this protocol.

b) Explain Time-token protocol in detail with a flow chart.

c) What are the various forms of error recovery?

                                                                          (7+7+4)

5.

a) Prove that the Rate monotonic algorithm is an optimal static-priority algorithm.

b) Comment on the suitability of FDDI protocol for the real time applications.

c) Discuss the issues in dynamic scheduling.

6.

a) Why a Real time databases should compromise some of the ACID properties of conventional databases?

b) Explain the concurrency control issues for databases.

c) What are the features of network topology for a distributed system, and illustrate few topologies neatly.

(4+4+10)

7.

a)　Determine whether the following set of periodic tasks is schedulable on a uniprocessor using RMA ignoring context switch overhead.

Task	Processing-time (mSec)	Period (mSec)
T1	38	112
T2	60	190
T3	72	425

Now, Suppose context switch overhead of 1 milli Seconds is to be taken into account, determine the schedulability.

b)　Explain static pairing.

Draw the schematic of a timing estimation system and briefly explain the same.

(8+5+5)