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) Why less buffer space is required in warmhole switching?

b) Explain, atleast three uni-processor scheduling algorithms in brief.

c) How Fault-tolerance is managed by properly using redundancy?

d) Why does it become difficult to predict the response time of transactions?

e) Explain briefly what do you understand by rollback and recovery. Why can't hard real time systems use rollback for error detection/recovery?

f) How can fault-tolerant communication be achieved in the presence of link and node failures?

g) Explain how absolute and relative consistency differs?

(7x4)

2.

a) How is each node in a network guaranteed timely access to the networks? Explain Time-token protocol in detail with a flow chart.

b) What are the properties of performance measures for control computers?

c) Explain the difference between Clock-Driven Scheduling and Priority Driven Scheduling of periodic tasks.

(8+4+6)

3.

a) Suppose that a system is in an unsafe state. Show that it is possible for the processes to complete their execution without entering a deadlock state.

b) Why is the polling latency typically faster than the interrupt latency?

(10+8)

4.

a) By giving state diagram of the fault classes, explain the causes for different types of faults and their remedies.

b) What are the various methods of concurrency control? Which of these may lead to deadlock and why?

(10+8)

5.

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

b) CSMA is an efficient communication scheme in case of end-to-end transmission delay is much less than the average time to transmit a packet and when the load is not very high but not for priority algorithm. In this context, explain, Virtual Time Carrier Sensed Multiple Access (VTCSMA) with the helps of real-diagram of virtual clock in VTCSMA.

(9+9)

6.

a) Compare Bluetooth and IEEE 802.11b in terms of internet applications, cost of technology, throughput achieved, power consumption, range of communication and multiple access technology.

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

(9+9)

7.

a) For the following task set, find the response time for task t4.

Priority	*Period*	*Comp.*	*time*
t1	1	101	1
t2	2	122	2
t3	3	308	8
t4	4	600	20

b) Explain static pairing.

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

(8+5+5)