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Total number of printed pages – 2

B. Tech
PECS 5403

Seventh Semester (Special) Examination – 2013

REAL TIME SYSTEMS

BRANCH : CSE, IT

QUESTION CODE : D 411

Full Marks – 70

Time : 3 Hours

*Answer Question No. 1 which is compulsory and any **five** from the rest.*

The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10
- (a) What is safety-Criticality ?
 - (b) What is software fault-tolerance ?
 - (c) What is a “fail-safe” state ?
 - (d) Give an example of an extremely safe but unreliable system.
 - (e) Describe an open system.
 - (f) With a suitable example explain the difference between the traditional notion of time and real-time system.
 - (g) How does an open system compare with a close system ?
 - (h) What are the drawbacks in using Unix kernel for developing real time applications ?
 - (i) List the different types of timing constraints that can occur in a real-time system.
 - (j) What is the difference between synchronous and asynchronous I/O ?
2. (a) Explain the important differences between hard, firm and soft real time systems. 5
- (b) Discuss about a basic model of a real time system. 5

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3. (a) Write about Periodic Task with its characteristics. 5
(b) Write Table-Driven Scheduling with example. 5
4. (a) Write about Priority Ceiling Protocol (PCP). 5
(b) It is difficult to achieve software fault tolerance as compared to hardware fault tolerance. Why? 5
5. (a) Discuss Utilization Balancing Algorithm. 5
(b) Discuss about Centralized clock synchronization. 5
6. (a) List the important features that are required to be supported by a RTOS. 5
(b) What are the shortcomings of Windows NT for developing a hard real-time application? 5
7. (a) Discuss which category of concurrency protocols is best suited under what circumstances? 5
(b) Traditional 2PL protocol is not suitable for use in real-time databases. Why? 5
8. Write short notes on any **two** : 5×2
(a) Earliest Deadline First (EDF) scheduling
(b) Handling task dependencies
(c) Buddy Algorithm
(d) POSIX-RT.

