Tribhuvan University
Institute of Science and Technology
2075
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Bachelor Level/Third Year/Six Semester/Science   Full Marks: 80
Computer Science and Information Technology (CSc. 354)   Pass Marks: 32
(Real Time System)   Time : 3 hours.

Candidates are required to give their answers in their own words as far as practicable.
The figures in the margin indicates full marks.

Group A

Attempt any Two questions.   (2×12=24)

1. List the advantage and disadvantage of priority based scheduling. State the validation problem for priority based system and explain with example.
2. Compare and contrast between fixed and dynamic priority system. "The implementation of slack stealing server for fixed priority system is difficult." Is it true? Explain.
3. List the properties of basic priority inheritance protocol. "The priority ceiling protocol avoids both priority inversion and deadlock in resource allocation." Justify it with suitable example.

Group B

Attempt any Eight questions.   (8×7= 56)

4. Explain how real-time commands are handled in Air Traffic Control (ATC) System.
5. What is timing constraints? Explain the characteristics of Hard Real-Time system with example.
6. What is the major difference between precedence and task graph? Explain about the functional parameter of real-time jobs.
7. How sporadic jobs are scheduled in EDF scheduling? Explain with example.
8. List the assumptions made for priority driven scheduling. Construct the LST schedule for a system with tasks T1(2, 0.5), T2(3, 1), and T3(6, 2).
9. State the optimality conditions for dynamic priority algorithms. Consider a system with real-time tasks T1 (4, 1, 6), T2 (10, 2, 20), T3(20, 1, 30), T4 (10, 0. 5, 8) and T5 (8, 1) are scheduled by using RM or DM algorithms. Find is it feasible to schedule or not.
10. Define critical instant. Calculate the critical instant for real-time tasks: T1(2, 0. 6), T2(2. 5, 0. 5), and T3 (3, 1. 2) schedule through the Deadline Monotonic (DM) algorithms over the interval (0, 12).
11. Explain about Multiprocessor Ceiling Protocol (MPCP) for resource allocation in a multiprocessor system with example.
12. Define the terms Throughput, Delay and jitter. How medium access protocol used in control area network (CAN)? Explain.
13. Write short notes on (any two):
    a) Inter-Processor Communication (IPC)
    b) Weighted Fair Queuing Server
    c) Offline Vs. Online Scheduling