

## L6 RT Scheduling

**1. Which of the following is NOT a key requirement of a Real-Time Operating System (RTOS)?**

- A. Timeliness
- B. Predictability
- C. Maintainability
- D. Average Throughput

**Answer: D**

**2. A periodic task is characterized by which three attributes?**

- A.  $(C_i, T_i, D_i)$
- B.  $(C_i, J_i, D_i)$
- C.  $(T_i, D_i, R_i)$
- D.  $(C_i, T_i, R_i)$

**Answer: A**

**3. For Rate Monotonic (RM) scheduling with implicit deadlines (period = deadline) and harmonic task periods, what is the utilization bound?**

- A. 0.828
- B. 0.780
- C. 0.693
- D. 1.0

**Answer: D**

**4. Which schedulability test is both necessary and sufficient for Earliest Deadline First (EDF) with implicit deadlines?**

- A. Utilization bound  $U \leq N(2^{1/N} - 1)$
- B. Utilization bound  $U \leq 1$
- C. Response Time Analysis (RTA)
- D. None of the above

**Answer: B**

**5. The Mars Pathfinder priority inversion bug was resolved using:**

- A. Rate Monotonic Scheduling
- B. Priority Inheritance Protocol (PIP)
- C. Least Laxity First (LLF)
- D. Static Cyclic Scheduling

**Answer: B**

**6. In Least Laxity First (LLF) scheduling, priority is determined by:**

- A. Absolute deadline
- B. Remaining execution time
- C. Laxity  $(d_i - t - e_i)$
- D. Task period

**Answer: C**

**7. Dhall's effect primarily affects which scheduling algorithms in multiprocessor systems?**

- A. LLF and EDF
- B. RM, DM, and EDF
- C. Static Cyclic Scheduling
- D. Partitioned Scheduling

**Answer: B**

**8. A sporadic task is defined by having:**

- A. Arbitrary interarrival times
- B. A minimum interarrival time constraint
- C. Periodic activation

D. No deadline

**Answer: B**

**9. Which type of jitter refers to the variation in the time between a task's start and finish?**

A. Start-time jitter

B. Finish-time jitter

C. Completion-time (I/O) jitter

D. Activation jitter

**Answer: C**

**10. A feasible schedule is defined as one where:**

A. Tasks execute in harmonic periods

B. All tasks complete within specified constraints

C. Utilization exceeds 0.69

D. No preemption occurs

**Answer: B**

**11. A set of tasks is schedulable if:**

A. Its total utilization is  $\leq 1$

B. It passes the Rate Monotonic bound test

C. There exists at least one feasible schedule

D. All tasks are periodic

**Answer: C**

**12. Partitioned scheduling in multiprocessor systems is analogous to:**

A. Global queue management

B. Bin-packing problem

C. Priority inversion

D. Work-conserving scheduling

**Answer: B**

**13. Global scheduling is characterized by:**

A. Assigning tasks to specific processors

B. Work-conserving behavior with a common queue

C. Using harmonic periods for all tasks

D. Prohibiting task migration

**Answer: B**

**14. The recursive equation for Response Time Analysis (RTA) for Fixed-Priority Scheduling is guaranteed to converge to a finite value.**

A. True

B. False

**Answer: B**