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## M.Tech. Degree Examination, June/July 2014 **Real Time Operating Systems**

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions.

- Explain briefly the history of embedded systems and write the pseudo code for basic real -1 time service. (08 Marks)
  - Differentiate between preemptive and non preemptive scheduling. (05 Marks)
  - Explain thread safe reentrant function. (07 Marks)
- Write neat diagrams, explain hard real time service utility, isochronal service utility, and best effort service utility. (10 Marks)
  - b. Explain RM – LUB sufficient feasibility test by taking the example of two service.
  - (08 Marks)
  - Calculate the utility of the CPU resource achievable for the task with  $T_1=3$ ,  $T_2=5$ ,  $C_1=C_2=1$ .
- Explain the worst case execution time of a service. (10 Marks)
  - Explain the following:
    - i) Shared memory
    - ii) ECC memory. (10 Marks)
- Define priority inversion. Mention the three conditions that causes unbounded priority inversion. Explain the solution for unbounded priority inversion. (10 Marks)
  - b. Explain the deadlock and live lock. (10 Marks)
- Explain in brief any three hardware components of a real time embedded system. 5

(10 Marks)

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- Explain the following:
  - i) Reentrant application libraries
  - ii) Communicating and synchronized applications. (10 Marks)
- Briefly explain the three level of single step debugging in embedded systems. (10 Marks)
- Explain the following:
  - i) Trace ports
  - ii) Power on self test and diagnostics.

(10 Marks)

Describe the basic concept of drill down tuning.

Mention the methods for optimizing code segments.

- (10 Marks) (10 Marks)
- - Compare reliability and availability. Also discuss reliability with an example. (10 Marks)
    - Explain multitasking application by considering the example of digital clock and thermometer that runs on PIC microcontrollers. (10 Marks)