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10EC842

# Eighth Semester B.E. Degree Examination, Dec.2019/Jan.2020
# Real Time Operating Systems

Time: 3 hrs. Max. Marks:100

**Note:** ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***



## PART – A

1 a. Write the pseudocode outline of a basic event driven software service and explain. **(10 Marks)**

b. With diagrams explain all the parts in a real time service time line with and without Hardware acceleration. **(10 Marks)**

2 a. Draw the real time service utility graph for the following and explain with example:
(i) Hard Real Time (ii) Hard RT Isochronal (iii) Best effort service (iv) Soft real time
(v) Anytime service (vi) Soft Isochronal. **(12 Marks)**

b. Draw the state transition diagrams and explain the function of various service states. **(08 Marks)**

3 a. What is feasibility? Explain sufficient and N&S feasibility testing with RM policy and draw the relationship between sufficient and N&S feasibility. **(08 Marks)**

b. Explain Deadline Monotonic policy with the equation for partial interference. **(06 Marks)**

c. Draw and explain the concept of EDF policy cascading failure overload scenario. **(06 Marks)**

4 a. Explain a simple pipeline with an example of stage overlap depth = 4. **(06 Marks)**

b. Explain physical memory hierarchy in Harvard architecture and how it is logically partitioned and segmented by the firmware. **(08 Marks)**

c. Discuss different types of cache mapping. **(06 Marks)**

## PART – B

5 a. What is blocking? Explain with neat figure Deadlock and Livelock. **(08 Marks)**

b. Define priority inversion. What causes unbounded Priority Inversion? **(04 Marks)**

c. Explain how missed deadlines can be handled in a number of ways for Soft Real Time Services. **(08 Marks)**

6 a. Define firmware and explain. Draw the diagram of device driver firmware interface and explain. **(06 Marks)**

b. What is meant by single step debugging? Mention the levels of single step debugging. **(04 Marks)**

c. Explain Trace ports and application level debugging. **(10 Marks)**

7 a. Describe the basic concepts of drill down tuning. **(10 Marks)**

b. Write the basic methods for building performance monitoring into software and explain. **(10 Marks)**

8 a. Describe reliability and availability with equation, diagrams and example. **(10 Marks)**

b. Explain the design issues for process and memory management in the RTOS design for a PIC microcontroller. **(10 Marks)**

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