USN | | | | | | | | | | |

10EC842

Eighth Semester B.E. Degree Examination, June/July 2019
Real –Time Operating Systems

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. With example define Embedded system and Real Time system; Also discuss the components of response time in a real time service along with the timeline. **(07 Marks)**

b. With pseudocode, discuss the basic event driven software service. **(07 Marks)**

c. With example, discuss how service processing may be accelerated with hardware in a real time service. Also give the timeline for the same. **(06 Marks)**

2 a. Briefly explain hard real-time service utility, isochronal service utility and any time service utility with a neat diagram. **(06 Marks)**

b. With two service example S_1 and S_2 time periods of $T_1 = 2$, $T_2 = 5$, execution times $C_1 = 1$, $C_2 = 2$, explain preemptive fixed priority scheduling policy. **(06 Marks)**

c. With diagram, explain different thread states with their transitions. **(08 Marks)**

3 a. Define Lice and Layland proposed sufficient feasibility test (RM LUB). By taking the example of two services show the derivation procedure. **(10 Marks)**

b. Describe the two algorithms for determination of N and S feasibility for RM Policy. **(10 Marks)**

4 a. Explain intermediate I/O, overlap definitions, overlap conditions and deduce the axioms about overlap. **(09 Marks)**

b. Explain a simple pipeline with an example of stage overlap depth = 4. **(05 Marks)**

c. With diagram explain two types (Direct, set association) of cache organization. **(06 Marks)**

PART – B

5 a. Briefly explain priority inversion. Mention the three conditions that cause unbounded priority inversion. **(06 Marks)**

b. Describe deadlock and livelock with an example. **(04 Marks)**

c. Explain the ways of handling missed deadlines and Quality Of Service (QOS) for a real time system with equations. **(10 Marks)**

6 a. Describe any four software mechanism for a RTOS system. Write an algorithm for application software using two tasks. **(14 Marks)**

b. With diagram, explain how message Qqueue and heap based message queue are helpful for inter-task communication. **(06 Marks)**

7 a. Briefly explain Drill-down tuning. **(10 Marks)**

b. Explain basic methods for building performance monitoring capability into Hardware and software. **(10 Marks)**

8 a. Define reliability and availability. Explain reliability in detail and also write similarity and differences of reliability and availability. **(10 Marks)**

b. Describe RTOS design issues in a PIC-microcontroller. **(10 Marks)**

* * * * *