EIGHTH SEMESTER B. TECH DEGREE EXAMINATION

2013 scheme

13.803 EMBEDDED SYSTEMS (F)

Time: 3 Hours          Max Marks: 100

PART –A

Answer all questions. Each question carries 4 marks.

1. Compare microprocessors and microcontrollers

2. Explain the role of sensors and actuators in Embedded systems.

3. What is the most important feature in C that makes it a popular high level language for an embedded system?

4. What do you understand by the term “real-time”? How is the concept of real-time different from the traditional notion of time? Explain your answer using a suitable example.

5. How to calculate performance metrics in RTOS? (5 X 4 = 20 marks)

PART –B

MODULE –I

6. (a) How are Processor and memory organized in embedded system? (12 mark)

   (b) What is ROM image? Explain the process of converting a ‘C’ program into ROM image? (8 mark)

OR

7. (a) What is CAN bus? Explain the format of CAN frames? (10 mark)

   (b) Explain the role of interrupt pending register? (10 mark)

MODULE -II

8. (a) What do you mean by Cross compilers and why do you need it? (10 mark)

   (b) Explain in detail use of modifiers in embedded C programming? (10 mark)
9. (a) What are Queues. Explain in detail how queues play a vital role in Network Communication? (10 mark)

(b) Explain the use of function calls in embedded C programming? (10 mark)

MODULE III

10. (a) Identify the key differences between hard real-time, soft real-time, and firm real-time systems. Give at least one example of real-time tasks corresponding to these three categories. Identify the timing constraints in your tasks and justify why the tasks should be categorized into the categories you have indicated. (10 mark)

(b) Explain Inter Process Communication with an example? (10 mark)

OR

11. (a) State whether you consider the following statements to be TRUE or FALSE. Justify your answer in each case.

i. A hard real-time application is made up of only hard real-time tasks.

ii. It should be the goal of any good real-time operating system to complete every hard real-time task as ahead of its deadline as possible. (10 mark)

(b) If you are asked by your organization to develop software which should be highly reliable, how would you proceed to achieve it? (10 mark)

MODULE IV

12. (a) Explain the features of real time operating systems and services? (10 mark)

(b) Explain different task scheduling models? (10 mark)

OR

13. (a) How is interrupt latencies and deadlines handled in real time operating system? (10 mark)

(b) How do we organize file systems in RTOS.? (10 mark)