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Eighth Semester B.E. Degree Examination, December 2011
Embedded System Design

Time: 3 hrs.

Max. Marks:100

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

PART – A

- 1 a. What is market window? Why is it important for products to reach the market early in window? Justify. (08 Marks)
- b. Explain how the top-down design process improves the productivity. (06 Marks)
- c. Using the revenue model of Fig.Q1(c), derive the percentage revenue loss equation for any rise angle, rather than just for 45 degrees. (06 Marks)

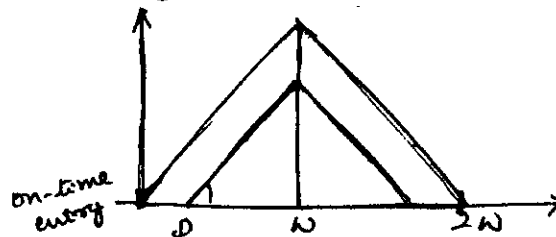


Fig.Q1(c)

- 2 a. Write a simple algorithm for finding the GCD of two integer numbers. Write the FSM for this algorithm. Explain how it can be optimized. Write the optimized FSM and its advantages. (10 Marks)
- b. Briefly explain the purpose of the data path and controller, in a single purpose processor. (10 Marks)
- 3 a. Explain how stepper is controlled using driver. Give relevant hardware and software details. (10 Marks)
- b. In successive approximation, ADC, calculate the correct encoding of 5V, given an analog signal whose voltage ranges from 0 to 15V and a 8-bit digital encoding. Also, determine the resolution of the ADC. (10 Marks)
- 4 a. What is memory hierarchy? How does the cache operate? Discuss the cache mapping technique. List its merits and demerits. (10 Marks)
- b. Describe the I²C and IEEE 802.11 protocols. (10 Marks)

PART – B

- 5 a. Explain how the interrupt works in a microprocessor. With an example, explain the classic shared data problem, when the data is shared between an interrupt and a task. (10 Marks)
- b. Explain the real time OS architecture. (05 Marks)
- c. What is the interrupt latency? What factors affect it? (05 Marks)
- 6 a. Explain with an example, how round robin architecture works. What is its limitation? (10 Marks)
- b. What are the three different states of task in RTOS? How is the state of each task tracked? (05 Marks)
- c. How does a typically RTOS binary semaphore works? Explain. (05 Marks)
- 7 a. Mention the two rules of interrupt routine in an RTOS environment. With an example, briefly explain, what happens when each rule is violated. (15 Marks)
- b. Compare characteristics of the four software architectures for scheduling. (05 Marks)
- 8 a. Illustrate with suitable examples, the problems of 'delay embrace' and 'priority inversion' (12 Marks)
- b. Explain the methods to solve the memory space and methods to save power. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

