Embedded Systems VTU Question Paper Set 2017
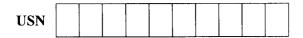
Sixth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Embedded Systems

Time: 3 hrs.   Max. Marks:100

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

PART – A

1   a. Discuss the skills required for designing different types of embedded systems. **(06 Marks)**
    b. Explain the registers of 6808 and 6811 microcontrollers. **(06 Marks)**
    c. Explain single chip mode of operation of 6811 microcontroller. Also explain the expanded mode of operation giving the block diagram of the EVB system. **(08 Marks)**

2   a. Compare the characteristics of different types of ROMs used in embedded systems. **(07 Marks)**
    b. Discuss the issues to be considered when designing a cordless bar code scanner. **(03 Marks)**
    c. Explain the working of a 3bit unsigned and signed DAC using R-2R ladder network. **(10 Marks)**

3   a. Explain any two software methods used for generating analog waveforms. **(08 Marks)**
    b. With neat figures, explain working of an 8 bit Ramp ADC. **(06 Marks)**
    c. Define the following with respect to ADC: i) Range; ii) Precision; iii) Resolution. **(06 Marks)**

4   a. What is the need for a sample and hold circuit? Explain its operation for an ADC. **(04 Marks)**
    b. With the help of flowcharts, explain ADC interrupt software. **(06 Marks)**
    c. Explain with block diagram of code, software implementation of successive approximation ADC. **(10 Marks)**

PART – B

5   a. With a suitable example, explain shared data problem. **(07 Marks)**
    b. Explain Round Robin with interrupts architecture with the help of a pseudocode. **(06 Marks)**
    c. List the problems associated with semaphores. Explain priority inversion. **(07 Marks)**

6   a. What is a Reentrant function? Mention the rules to be applied to check a function for reentrancy. **(06 Marks)**
    b. With a suitable example, show how semaphores can be used to make a function reentrant. **(08 Marks)**
    c. What is a task? What are the three states in which a task can exist? Explain. **(06 Marks)**

7   a. What is switch bounce? Discuss how a capacitor can be used to eliminate switch bounce when pressed and released with relevant waveforms. **(10 Marks)**
    b. Explain the different schemes for inter facing keys to an 8 bit parallel port. **(06 Marks)**
    c. With figures, explain: i) Half duplex; ii) Full duplex serial communication. **(04 Marks)**

8   a. With block diagrams, explain the architecture of a computer with memory mapped I/O and isolated I/O. **(08 Marks)**
    b. Explain how a 32K PROM can be interfaced to a 6811 μC, with neat figures. **(12 Marks)**

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Sixth Semester B.E. Degree Examination, June/July 2016
Embedded Systems

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. Discuss the characteristics of different types of ROMs and RAMs used in Embedded systems. **(08 Marks)**
   b. Define addressing mode. Explain with an example, various types of addressing modes of 68HC11 microcontroller. **(08 Marks)**
   c. What are the various issues to be considered while designing a Cordless barcode scanner? **(04 Marks)**

2 a. Classify the embedded systems and explain the skills required for an embedded system designer. **(08 Marks)**
   b. Explain briefly various issues to be consider for selecting DAC in embedded system design. **(08 Marks)**
   c. Explain various registers available in 68HC11 microcontrollers. **(04 Marks)**

3 a. With neat block diagram and necessary waveforms explain 8 bit Ramp ADC. **(08 Marks)**
   b. Explain the sample and hold circuit with diagram and briefly explain its necessity. **(08 Marks)**
   c. Define the following with respect to data acquision system.
       i) Accuracy   ii) Resolution   iii) Precision   iv) Reproducibility. **(04 Marks)**

4 a. Explain three main design technologies. How are these helpful to designers? **(10 Marks)**
   b. Explain the various design metrics of an Embedded system. **(10 Marks)**

PART – B

5 a. Give a comparison of characteristics of various software architecture. **(08 Marks)**
   b. Discuss about the problems associated with the use of semaphores. **(08 Marks)**
   c. What is an RTOS? Explain how RTOS is different from desktop machine operating system. **(04 Marks)**

6 a. Explain Round Robin architecture with interrupts with the help of its pseudocode. Also discuss the drawbacks of this architecture. **(08 Marks)**
   b. Define the following data structures used in C. When can they be used? Give examples for each i) Queue   ii) Stack   iii) Array   iv) Tree. **(08 Marks)**
   c. What is a reentrant function? List the rules to check if a function is re-entrant or not. **(04 Marks)**

7 a. With a neat circuit diagram, explain the isolated H-bridge used to drive the motor in both direction and also explain the digital logic circuit used with an H-bridge. **(10 Marks)**
   b. With neat diagrams, explain the memory mapped I/O and isolated I/O types of computer architecture. **(04 Marks)**
   c. Explain the following with respect to serial IO i) Simplex communication   ii) half Duplex communication   iii) Full deplex communication. **(06 Marks)**

8 a. Design a circuit to interface 8K×8 bit static RAM to 68HC11 microcontroller from 8000 memory location. Draw read and write timing diagram. **(10 Marks)**
   b. Explain how hardware debouncing is done using capacitor. Draw necessary waveforms. **(10 Marks)**

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