

Embedded Systems VTU CBCS Question Paper Set 2018



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10EE665

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

PART – A

- 1 a. Define Embedded system. Explain the main components of embedded system. (07 Marks)
b. Explain the skill required for small scale, medium scale and sophisticated embedded system design. (08 Marks)
c. Compare the architecture of 6808 and 6811. (05 Marks)
- 2 a. Explain the applications of embedded systems. (10 Marks)
b. Draw the block diagram of Embedded systems SOC for cellless bar code scanner and explain it's features and benefits. (10 Marks)
- 3 a. Explain the interfacing of DAC to micro-processor system. (07 Marks)
b. Explain the following :
i) Basic Data Acquisition system (08 Marks)
ii) Signal Conditioning using DSP. (05 Marks)
- 4 a. Explain the issues observed in embedded system design. (10 Marks)
b. Briefly describe the top-down design process. (05 Marks)
c. Write a note on Thermal considerations. (05 Marks)

PART – B

- 5 a. With a neat diagram, explain the components of an operating system. (05 Marks)
b. Explain services provided by the Kernel. (10 Marks)
c. Mention the advantages of 'C' as a High level language. (05 Marks)
- 6 a. Briefly describe function queue scheduling architecture. Mention advantages and disadvantages of Round-Robin with Interrupt architecture. (10 Marks)
b. Explain the classification of Real-time operating system (RTOS) and describe its features. (10 Marks)
- 7 a. Define with respect to serial I/O.
i) Full duplex communication
ii) Half duplex communication
iii) Simplex communication
iv) Baud rate
v) Frame. (10 Marks)
b. Explain three basic approaches of interfacing multiple keys to a single 8-bit parallel port. (10 Marks)
- 8 a. Explain the software Debouncing. With a help of flowcharts and 'C' code. (10 Marks)
b. Explain architecture of a computer with memory mapped I/O and isolated I/O with aid of neat diagram. (10 Marks)

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2. Any revealing of identification, appear to evaluator and/or equations written eg. 42-8=30, will be treated as malpractice.

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10EE665

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 interfacing 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 μ C, with neat figures. (12 Marks)

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Important Note: 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any recoding of identification number, question number, page number and the question number as 10EE665 will be treated as malpractice.

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10EE665

Sixth Semester B.E. Degree Examination, Dec.2017/Jan.2018
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. What is an embedded system? Explain different types of embedded systems. (08 Marks)
b. Explain 6811 EVB system with block diagram. (12 Marks)
- 2 a. Explain with Figure working of RAM memory. (08 Marks)
b. Explain any Four examples of embedded systems. (12 Marks)
- 3 a. With Figure and waveforms, explain working of 16 bit dual slope ADC. (12 Marks)
b. Explain the data acquisition system of EKG. (08 Marks)
- 4 a. Discuss the various design challenges of embedded system. (12 Marks)
b. Explain the different issues in embedded design in brief. (08 Marks)

PART – B

- 5 a. Write the characteristics of the round – robin – with interrupts architecture. (12 Marks)
b. Give the comparison of characteristics of various software architectures. (08 Marks)
- 6 a. Explain in detail the use of semaphore as a signaling device. (12 Marks)
b. Write the different semaphore variants. (08 Marks)
- 7 a. Explain with Figures half duplex and full duplex communication. (08 Marks)
b. Explain how hardware debouncing is done using capacitor. Draw necessary waveforms. (12 Marks)
- 8 a. Interface 6811 microcontroller to 8k by 8 bit static RAM. Draw read and writes timing diagrams. (12 Marks)
b. With figure explain the case study of embedded velocity PID controller. (08 Marks)

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