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06CS74

Seventh Semester B.E. Degree Examination, June 2012

Embedded Computing Systems

Time: 3 hrs. Max. Marks:100

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

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.

PART – A

1 a. Define an embedded system. Explain the components of embedded system hardware. **(06 Marks)**

b. Point out major differences between Harvard and Von Neuman architecture. **(04 Marks)**

c. Explain the various software tools for designing an embedded system. **(08 Marks)**

d. Point out various applications of embedded system. **(02 Marks)**

2 a. Compare the advantages and disadvantages of data transfer using serial and parallel ports/devices. **(10 Marks)**

b. Describe and compare UART, Rs232C, SDI_o devices. **(10 Marks)**

3 a. What is a timer? How does a counter perform :
i) timer functions?
ii) prefixed time initiated event generation?
iii) time capture functions? **(10 Marks)**

b. Explain the following wireless and mobile system protocols :
i) Bluetooth ii) Zig Bee **(10 Marks)**

4 a. What do you mean by throwing an exception? How is the exception condition during execution of a function (routine) handled? **(10 Marks)**

b. What are the uses of hardware and software assigned priorities in interrupt service mechanism? **(10 Marks)**

PART – B

5 a. What are the different programming models? Give an example, explain the SDFG model. **(10 Marks)**

b. What is a semaphore? What are the IPC functions used by a software programmer? Explain them. **(10 Marks)**

6 a. What is a process manager? What are its services? **(06 Marks)**

b. What is RTOS? Point out and explain the various services of RTOS. **(10 Marks)**

c. Explain the user and supervisory mode structure in OS. **(04 Marks)**

7 a. Explain preemptive scheduling model. Point out the various scheduling models. **(08 Marks)**

b. What are the important operating system security issues? List the important security function. **(04 Marks)**

c. What are the methods of optimizing memory space in RTOS? **(08 Marks)**

8 a. What is a target system? How is embedded software loaded into the target system? **(10 Marks)**

b. What is a simulator? Illustrate the detailed design development process using a simulator. **(10 Marks)**

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06CS74

Seventh Semester B.E. Degree Examination, December 2012
Embedded Computing Systems

Time: 3 hrs. Max. Marks:100

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

Important Note: 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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PART – A

1 a. Give the characteristics and constraints of embedded system. **(04 Marks)**

b. Define design metrics in an embedded system. What are the different computing design metrics? What are the challenges faced in designing an embedded system. **(10 Marks)**

c. Describe the software tools used for designing an embedded system. **(06 Marks)**

2 a. With neat sketch, explain synchronous serial input and synchronous serial output operation. **(10 Marks)**

b. Briefly explain the skills required for an embedded system designer. **(06 Marks)**

c. Write a note on SDIO (secure digital input output). **(04 Marks)**

3 a. Describe: i) Timing device; ii) Counting device; iii) Timer cum counting device. **(06 Marks)**

b. Explain watch dog timer with any one its applications. **(06 Marks)**

c. With neat sketch, explain the control bit format in I^2C bus protocol. **(08 Marks)**

4 a. What is interrupt vector? Explain various mechanism of interrupt vector with suitable examples. **(10 Marks)**

b. Differentiate between device driver functions and ISR functions. **(05 Marks)**

c. Explain the role of device drivers in interaction with device hardware with suitable example. **(05 Marks)**

PART – B

5 a. Explain the modeling of a multi-processor system. **(07 Marks)**

b. Distinguish between function, ISR and Task. **(06 Marks)**

c. Define process and tasks. Explain the tasks with their states. **(07 Marks)**

6 a. Describe any four RTOS timer functions and the actions on calling these functions. **(04 Marks)**

b. Explain file system organization and implementation in an OS for an embedded system. **(08 Marks)**

c. Explain process creation and management of created process. **(08 Marks)**

7 a. Briefly explain the design principles when using an RTOS to design an embedded system. **(10 Marks)**

b. List any four common RTOS task scheduling models. **(04 Marks)**

c. Describe fixed real time scheduling model with an example. **(06 Marks)**

8 a. What are the features of integrated development environment (IDE)? Explain. **(07 Marks)**

b. Describe the platform dependency issues and the need for appropriate OS-hardware interface functions. **(08 Marks)**

c. Discuss the limitations of simulation with appropriate illustration. **(05 Marks)**

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