Register Number: ……

B.TECH DEGREE EXAMINATIONS: APRIL/MAY 2012

Sixth Semester

INFORMATION TECHNOLOGY

CSE123: Embedded Systems

Time: Three Hours **Maximum Marks: 100**

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. A watchdog timer

   a. Synchronizes the program counter b. Monitors the interrupt

   c. Resets the system after a predefined timeout. d. Generates pulses

2. RISC is

   a. Real time improved speed computer b. Reduced instruction set computer

   c. Real time inter system communication d. Reduced inter system computer.

3. RS232 is a standard for

   a. Parallel communication b. Asynchronous serial communication

   c. Simplex communication d. Half duplex communication

4. UART can send a byte in _____ format.

   a. 10 bits or 11 bits b. 11 bits c. 10 bits d.16 bits

5. The instruction length of PIC may be

   a. 8bit, 16 bit or 12 bit b.8 bit, 12 bit or 24 bit c. 12 bit, 14 bit or 16 bit d.16 bit or 12 bit

6. Orthogonal instruction set means

   a. Can be used in any microcontroller

   b. All the peripherals use same format of data

   c. All registers can use all the instructions interchangeably

   d. There is no format for the instructions

7. Interrupt latency is

   a. Delay between two interrupts b. Delay between interrupt occurrence and CPU response.

   c. Execution time of an interrupt d. Propagation delay

8. Kernel is

   a. A node

   b. Relocatable object code

   c. Software portion which provides task scheduling and dispatching

   d. Software portion which initiate an event

9. Time Slicing scheduling is

a. Preemptive scheduling b. Round robin scheduling

c. Cooperative scheduling d. Rate Monotonic Scheduling

10. MUCOS codes are in

a. C and Assembly b. C and Embedded C

c. FORTRAN and Embedded C d. Assembly and Embedded C

PART B (10 x 2 = 20 Marks)

11. What is the function of Execution unit in a processor?
12. What is the need for cross compilers?
13. Explain the difference between PCI and CAN bus.
14. Give any two applications of watchdog timer.
15. What are the addressing modes used in PIC Microcontroller?
16. What is the difference of Harvard model from Von Neumann model?
17. How RTOS differs from desktop OS?
18. What is the use of semaphores?
19. What are spinlocks?
20. Why should the embedded system RTOS be scalable?

PART C (5 x 14 = 70 Marks)

21. a) (i) Draw and explain the functional block diagram of microcontroller based embedded system. (10)

(ii) What are the various forms of memories in the systems? (4)

(OR)

b) (i) Write a note on the various software tools used in designing an embedded system.(10)

(ii) What are the challenges of Embedded Systems? (4)

22. a) Compare the characteristics of various buses used for networking of parallel devices.

(OR)

b) Explain the signals during a transfer of a byte when using the I^2C bus and write the format of the bits at the I^2C bus with diagrams.

23. a) With help of a diagram explain the internal architecture of PIC Microcontroller

(OR)

b) (i) Explain with suitable diagrams, the different types of timers and reset circuitry used in PIC microcontrollers. (7)

(ii) Write a program in the assembly code of PIC microcontroller, to add five numbers and store the result in Wreg. (7)

24. a) Compare the different scheduling algorithms available in RTOS?

(OR)

b) Explain with example the use of semaphores in shared resource systems.

25. a) Explain the memory management functions defined by any RTOS of your choice.

(OR)

b) Explain with suitable block diagrams the design of a smart card embedded system.

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