Register Number: ……………………..

B.TECH DEGREE EXAMINATIONS: MAY/JUNE 2013

Sixth Semester

INFORMATION TECHNOLOGY

CSE 123 : Embedded Systems

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

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1.   Small Scale Embedded Systems

     a)   8 bits   b)   16 bits

     c)   32 bits   d)   8 bits or 16 bits

2.   A watchdog timer

     a)   Synchronises the program counter   b)   Monitors the interrupt

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

3.   Which determines the rate at which the bits of data can send and received?

     a)   HDLC   b)   UART

     c)   USART   d)   USB

4.   UART can send a byte in _____ format.

     a)   10 bits   b)   11 bits

     c)   10 bits or 11 bits   d)   16 bits

5.   PIC microcontrollers are

     a)   CISC processors   b)   RISC processors

     c)   Specific application processors   d)   Both RISC and CISC

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   d)   There is no format for the instructions
          interchangeably

7.   Interrupts are not allowed to interrupt the

     a)   high priority tasks   b)   Functions

     c)   ISR   d)   Critical Section of the code

8. The interrupt handling function Int Unlock () describes

   a) Disables interrupt   b) Set the interrupt vector

   c) Enables interrupt   d) Get the interrupt vector

9. The mailbox IPC is used to

   a) Communicate a message   b) communicate a pointer for a message

   c) pass the global parameters   d) pass the local parameters.

10. MUCOS codes are in

   a) C and Assembly   b) . FORTRAN

   c) C++   d) Java

PART B (10 x 2 = 20 Marks)

11. Why do you need at least one timer device in an embedded system?

12. List out few testing tools.

13. What is handshaking in bus interface?

14. Differentiate counter and timer.

15. Define Harvard architecture.

16. What are the addressing modes used in PIC Microcontroller?

17. What are the design principles to be considered while using the RTOS to design an embedded system?

18. What are semaphores?

19. Give the four memory allocation related functions of RTOS.

20. List the software architecture layers for designing a Digital Camera System.

PART C (5 x 14 = 70 Marks)

21. a) (i) Draw the block diagram of an embedded system and explain its components.   (10)

        (ii) Write a note on the various software tools used in designing an embedded system.   (4)

(OR)

    b) What are the types of I/O devices? Explain it with examples.

22. a) (i) Explain the operation of UART with neat diagram.   (10)

        (ii) Compare the characteristics of various buses used for networking of parallel devices.   (4)

(OR)

b)   Describe in detail about the I^2C bus operation.

23. a)   What are the different types of interrupts available in PIC microcontrollers? Explain any two interrupts.

(OR)

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

24. a)   Write in detail about various RTOS scheduling algorithms

(OR)

b)   Write short notes on : i) Spin lock
                                    ii) Inter process communication using signals

25. a)   What is the need for
                  i) Reentrant function.
                  ii) ISR queues in embedded system software?

(OR)

b)   Discuss in detail about memory allocation and deallocation functions in RTOS.

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