KUMARAGURU
college of technology
character is life

Register Number: ……..

B.TECH DEGREE EXAMINATIONS: NOV/DEC 2014

(Regulation 2009)

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. Number of address lines required for a microprocessor to access 4 Kb memory is _____
   a) 16 b) 12
   c) 8 d) 10
2. A watchdog timer _____
   a) Monitors the interrupt b) Synchronises the program counter
   c) Generates pulses d) Resets the system after a predefined timeout
3. SPI is used for _____
   a) LAN Inter face b) Serial full duplex communication
   c) Inter processor communication d) Debugging
4. UART can send a byte in _____ format.
   a) 10 bits b) 11 bits
   c) 10 bits or 11 bits d) 16 bits
5. 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
6. 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
7. OS runs on _____

a) User parallel mode
b) supervisory serial mode
c) user and supervisory mode
d) serial and parallel mode

8. A spin lock is used _____
a) To protect the critical section resources
b) To activate the ISR
c) As a mailbox
d) To prioritize the interrupts.

9. MUCOS codes are in _____
a) C and Assembly
b) FORTRAN
c) C++
d) Java

10. Interrupts are not allowed to interrupt the _____
a) High priority tasks
b) Complicated processes
c) ISR
d) Critical section of the code

PART B (10 x 2 = 20 Marks)

11. Why is an embedded processor preferred over a microprocessor or microcontroller in an embedded system?
12. What is a watchdog timer?
13. Compare a half Duplex and a full duplex serial communication through ports.
14. Explain about handshaking in bus interface.
15. In what ways RISC and CISC processors differ?
16. Define Harvard architecture.
17. When is RTOS needed in embedded software?
18. Explain how context switching increases the overhead of a processor?
19. What are semaphores?
20. Give the four memory allocation related functions of RTOS.

PART C (5 x 14 = 70 Marks)

21. a) (i) Draw the block diagram of an embedded system and explain its components. (10)
(ii) Explain briefly about the different types of digital memories. (4)

(OR)

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

22. a) (i) Compare the various bus standards that are used to provide parallel communication. (7)

(ii) Explain the parallel port interfacing for an LCD controller with any microcontroller of your choice. (7)

(OR)

b) (i) Describe in detail about the I^2C bus operation. (8)

(ii) Compare the RS232C and UART protocols used for serial communication in Embedded Systems. (6)

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

(OR)

b) (i) Differentiate Von Neuman and Harvard architecture. (4)

(ii) Describe any four instructions of PIC microcontroller. (10)

24. a) Write short notes on : (i) Spin lock

(ii) inter process communication using signals

(OR)

b) (i) Write short note on Mutexes. (4)

(ii) Explain the memory allocation related RTOS functions in detail. (10)

25. a) Discuss in detail memory allocation and deallocation functions in RTOS.

(OR)

b) What is the need for

(i) Reentrant function. (7)

(ii) ISR queues in embedded system software? (7)

****