

B.TECH DEGREE EXAMINATIONS: APRIL/MAY 2014

(Regulation 2009)

Sixth Semester

INFORMATION TECHNOLOGY

CSE123: Embedded Systems

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Demultiplexers are required to
 - a) Transmit a data from source to destination
 - b) Synchronise the transmission
 - c) Decode the address of a the channel selected for the transmission
 - d) Get the input from the processor
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. PCI provides synchronous parallel interface with bit width of
 - a) 32 extendable to 64
 - b) 16 extendable to 32
 - c) 16 extendable to 64
 - d) None of the above
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. A pre scalar divides the microprocessor _____ by some constant
 - a) Clock
 - b) Timer
 - c) Address Lines
 - d) Control Lines
7. PIC microcontrollers are
 - a) CISC processors
 - b) RISC processors
 - c) Specific application processors
 - d) Both RISC and CISC
8. OS runs on

- a) User parallel mode
 - b) supervisory serial mode
 - c) user and supervisory mode
 - d) serial and parallel mode
9. Queue related function includes
 - a) Creating a queue for an IPC
 - b) Creating a mailbox for an IPC
 - c) Waiting for availability of an IPC for a message at Mailbox
 - d) Send a message for an IPC through Mailbox
 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. Why do we have buffering effects while we are watching videos online on a computer?
13. Compare a half Duplex and a full duplex serial communication through ports.
14. How does a mobile phone keypad generate numbers as well as text messages with the same keys?
15. In what ways RISC and CISC processors differ?
16. What are the addressing modes used in PIC Microcontroller?
17. Explain how context switching increases the overhead of a processor?
18. When is an RTOS needed in embedded software?
19. What is the meaning of Task Service functions?
20. Give the operation of counting semaphore.

PART C (5 x 14 = 70 Marks)

21. a) (i) Explain the interfacing between a processor and a peripheral through parallel ports taking PPI as an example with necessary control signals and handshaking signals. (10)
(ii) Write the significance of watchdog timer. (4)
- (OR)**
- b) (i) What are embedded computers? Discuss the structural description and behavioural description of an embedded system. (7)
(ii) Draw the timing diagram for I/ O read and Explain. (7)
22. a) (i) Describe the serial communication using I²C bus in detail. (6)
(ii) Explain the parallel port interfacing for an LCD controller with any microcontroller of your choice. (8)

(OR)

- b) (i) Explain with block diagram the networking operation of PCI bus (8)
(ii) Compare the RS232C and UART protocols used for serial communication in Embedded Systems (6)

23. a) (i) Differentiate Von Neuman and Harvard architecture (4)
(ii) Describe any four instructions of PIC microcontroller (10)

(OR)

- b) (i) Explain with suitable diagrams, the different types of timers and reset circuitry used in PIC microcontrollers. (7)
(ii) Write a program to increment the numbers of an array by 1 and determine the number of machine cycles utilized. (7)

24. a) Write short note on Mutexes (4)
Explain the memory allocation related RTOS functions in detail (10)

(OR)

- b) With diagram explain interrupt latency and its significance in RTOS (7)
Write short notes on : i) Spin lock (7)
ii) inter process communication using signals

25. a) Identify the tasks for a digital camera. Explain the various inter process communication methods required in implementing the application.

(OR)

- b) Explain in detail the process of designing a smart card. Discuss the various stages of designing with variables and functions related to smart card.
