Register Number: ……..

B.E., DEGREE EXAMINATIONS: MAY/JUNE 2013

Sixth Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

EIE113: Real Time Embedded Systems

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

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. _____ is used for linking and interfacing buses and several units of an embedded system hardware

   a) AM circuit b) device driver

   c) glue logic circuit d) PWM circuit

2. The RTC is used to

   a) Reset the system after a predefined timeout b) Obtain software controlled delays and timeouts

   c) Execute the instruction d) Transfer the result to memory

3. The major benefit of the HARVARD Architecture is

   a) single word instruction and executes more quickly b) Code and data share the memory and increase the hardware efficiency

   c) Interrupt latency time is predictable d) code and data can be loaded into the CPU simultaneously on separate buses

4. The unit which is used to hold the byte or word fetched from external memory or I/O devices is

   a) MAR b) MDR

   c) Internal bus d) address bus

5. Which of the following is the speed of a PCI synchronous parallel interface?

   a) 62/66 MHz b) 62/100 MHz

   c) 32/33 MHz d) 24/32 MHz

6. The number of data lines in USB bus are

   a) 8 b) 4

   c) 2 d) 6

7. A Watch dog timer enables the implementation of real time systems providing

   a) a regularly timed interrupt for starting real time tasks b) a very flexible interrupt which is set for individual, critical real time tasks

   c) a mechanism for the safe shut down of a system if any task takes too long to complete d) timer triggered by external interrupt

8. The volatile keyword is used for in C programming of embedded system. Why?

a) To indicate that the memory being used in RAM
b) To indicate that the program can be modified
c) To indicate that the variable could be changed
d) To designated an interrupt routine activated by a hardware signal

9. _____ is used to trace the change in parameters for entire time history

a) stethoscope
b) Trace scope
b) Emulator
d) Memscope

10. Real-time operating system is one, which

a) allows flexible scheduling of the system resources (CPU, memory, etc.) to several tasks
b) controls the task synchronization using signals, semaphores and messages
c) is an OS for the microcontrollers
d) is an OS with preemptive scheduling

PART B (10 x 2 = 20 Marks)

11. What is the need for ASSPS in embedded system?
12. Define ISR
13. Define cache hit and cache miss
14. Define fragmentation
15. What are the classification of I/O devices
16. What is CAN bus? Where is it used?
17. Define non maskable interrupt
18. What is preemptive and non preemptive scheduling?
19. Name any two important RTOS
20. What are the issues in design of an embedded system?

PART C (5 x 14 = 70 Marks)

21. a) (i) Explain in detail about the hardware units of an embedded system. (10)

(ii) Write short notes on analog to digital converter. (4)

(OR)

b) (i) Explain the interrupt controller in detail. (7)

(ii) Explain various types of embedded processor in detail. (7)

22. a) Explain Direct memory access in detail.

(OR)

b) Explain cache memory mapping and address translation in detail.

23. a) (i) Explain the interfacing features in Devices /Ports. (7)

(ii) Explain in detail about I^2 C bus. (7)

(OR)

b) Explain the working of Timers and counters in detail.

24. a) (i) Write short notes on latency and transfer rate. (7)

(ii) Explain round robin architecture and priority based scheduling with example. (7)

(OR)

b) Explain how threads are used in embedded system. (7)

What is semaphore? Explain RTOS semaphore and context switching. (7)

25. a) Write short notes on (i) ROM emulator and (ii) in circuit emulator.

(OR)

b) Explain the various software tools used in RTOS.

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