Q.2a. What are the commonly used design matrices for Embedded System Design? Describe various techniques that can be used to map gate-level implementation onto an IC.

Answer: I Pg. 4,5,13, 14

Q2b. Differentiate between FSM and FSMD. Draw and describe controller and datapath to implement Greatest Common Divisor of two numbers.

Answer: I Pg 39, 41, 42

Q.3a. Describe the various design tools used to design, test and debug embedded software.

Answer: I Pg. 69, 70

Q3b. What is ASIPs? Describe three major varieties of ASIPs used.

Answer: I Pg. 74, 75

Q.4 a. Describe stepper motors and their use in Embedded Systems.

Answer: I Pg. 98, 99, Fig 4.9

Q4b. Differentiate between Timer and counters and describe the use of Watchdog Timer to implement timeout in Automatic Teller Machine.

Answer: I Pg. 84, 89, 90

Q.5a. Compare SRAM and DRAM. Draw and explain the internal structure of RAM.

Answer: I Pg. 118, 119, 120, Fig. 5.6

Q5b. Describe Memory hierarchy and cache-mapping techniques.

Answer: I Pg. 125, 126, Fig. 5.11, Fig. 5.12

Q6a. Describe various methods of Arbitration in case multiple peripherals request service from single source.

Answer: I Pg. 159, 160, 161, 162, Fig. 6.20

Q7b. Explain the difference between port based I/O and bus based I/O also discuss advantages and disadvantages of Memory mapped I/O Vs Standard I/O.

Answer: I Pg. 144,145, Fig. 6.6

Q.7a. **What is a task in RTOS? Describe various task states also explain Scheduler in RTOS.**

Answer: II Pg. 159, 160, Fig. 6.1

Q7b. **Describe Preemptive and non-preemptive Kernels. Also discuss techniques to protect shared data in RTOS**

Answer: II Pg. 162,163, 188, Fig. 6.3

Q.8a. **Explain Event in reference to RTOS and describe the standard features of event. Compare events and Semaphores**.

Answer: II Pg.211, 212

Q8b. **Discuss priority in interrupts and describe in detail with examples rules followed by Interrupt Routines in RTOS**

Answer: II Pg. 219, 220, 221, Fig. 7.14, 7.15

Q.9a. **Describe hard and soft real time systems. Give suitable examples. Discuss various power saving techniques in Embedded Systems.**

Answer: II Pg. 236, 277, 278

Q.9b. **Discuss encapsulation of Semaphores and queues.**

Answer: II Pg. 264, 265, 267, 268

Text Books

I **Embedded System Design, A unified Hardware/ Software Introduction, Frank Vahid/ Tony Givargis, 2006 reprint, John Wiley Student Edition.**

II **An Embedded Software Priner, David E Simon, Fourth impression 2007, Pearson Education.**