

# 18CS44 SIMP Questions

Prepared by the **CSE/ISE-TIE** review team

## Module-5

1. Define the terms Task, Process and Threads? Explain the Process structure, process states and state transitions.
2. Explain the functional and nonfunctional requirements to be considered while choosing an RTOS for an Embedded design
3. Explain Multi Threading, Write a multithreaded application to print “Hello I’m in main thread” from main thread and “Hello I’m in new thread”
4. Explain the role of Integrated Development Environment (IDE) for embedded software development.
5. With neat diagram explain operating system architecture
6. Write short notes on (i) Simulator and emulator (ii) Message passing (iii) Deadlock

## Module-3

1. Explain the system core of the Embedded systems, Explain briefly the applications and purposes of Embedded Systems
2. Explain the history of ES, Also differentiate between General Purpose Computing Systems and Embedded Systems
3. What are the different types of memories used in Embedded System design? Explain the role of each
4. Explain the following i) 7-Segment LED Display ii) Stepper Motor. iii) PLD and its types iv) OCI in ES v) Oscillator unit in ES (20M/4M each)
5. Explain the following: i) I2C ii) 1-Wire Interface iii) SPI Interface iv) Reset Circuit - 12M

## Module-1

1. Explain the major design rules to implement RISC philosophy, State differences between RISC and CISC processors.
2. Discuss the ARM design philosophy, also discuss about the ARM bus technology
3. Explain ARM core data flow model with a neat diagram
4. Along with neat diagram of an ARM based embedded device (Microcontroller), explain the four main hardware components, Briefly Explain ARM register used under various modes
5. Explain Pipeline in detail.
6. Briefly describe the concept of exceptions, interrupts and the vector table
7. Describe conditional execution. write the different code suffix

## Module-2

1. What do you mean by arithmetic instructions in ARM processor, Discuss the load & store instructions with respect to the Single Register Transfer
2. With a neat diagram explain Barrel Shifter
3. Explain the MOV instruction set provided by ARM7 with the example for each, briefly explain the working of ARM Swap instruction
4. Define instruction scheduling? Explain the rules summarizing the cycle timings for common instruction classes on the ARM9TDMI, Explain the scheduling of following instructions i) STR ii) LDRH iii) B Label - 12M
5. Write a note on Profiling and Cycle Counting.
6. Explain the ARM Single-Register and Multiple-Register load-store addressing modes with examples.
7. Explain Co-Processor instructions of ARM Processor.

## Module-4

1. Explain briefly the characteristics, operational and non-operational quality attributes of Embedded systems.
2. Explain Quality attribute in embedded system development ? What are the different quality attribute to be considered in an embedded system design
3. With the functional block diagram(if required), explain the operation of (i) Washing Machine as Application-Specific Embedded system (ii) Tea/Coffee vending machine (iii) Automatic seat belt warning system
4. Explain the basic approaches for designing Embedded Firmware.
5. Explain time to market and time to prototype. explain its significance in product development.
6. Explain with a neat block diagram, how source file to object file translation takes place.
7. Explain the fundamental issues in hardware software co-design