18CS44

Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

USN : | | | | | | | | | | |

Fourth Semester B.E. Degree Examination

Microcontroller and Embedded Systems

Time: 03 Hrs **Max. Marks:100**

Note: Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**

Module-1

1. a. Compare and Contrast microprocessor and microcontroller. 4M
   b. Explain ARM core data flow model with a neat diagram. 8M
   c. Along with neat diagram of an ARM based embedded device (Microcontroller), explain the four main hardware components. 8M

OR

2. a. Explain the different processor modes provided by ARM7. 8M
   b. Give the schematic of a Current Program Status Register of ARM7 processor briefing the individual bits. 6M
   c. What s Pipelining. Explain in detail schematically. 6M

Module-2

3. a. Explain the MOV instruction set provided by ARM7 with the example for each. 8M
   b. Explain the ARM swap instruction with an example code. 6M
   c. Brief about the categories of Load-Store instructions used with ARM. 6M

OR

4. a. Explain the ARM Single-Register and Multiple-Register load-store addressing modes with example. 8M
   b. Explain Co-Processor instructions of ARM Processor. 6M
   c. Write a note on Profiling and Cycle Counting. 6M

Module-3

5. a. What are the different types of memories used in Embedded System design? Explain the role of each. 10M
   b. List different purposes of embedded system with examples. 10M

OR

6. a. Briefly Describe the classification of embedded systems 8M
   b. Explain the following:
      i. I2C
      ii.1-Wire Interface
      iii. SPI Interface
      iv. Reset Circuit 12M

Module-4

7. a. What are the operational and non-operational quality attributes of an embedded systems. 10M
   b. Explain the different types of serial interface bus used in Automotive Communication. 4M

   c. Design FSM model for tea/coffee vending machine. 6M

OR

8. a. Explain the fundamental issues in hardware software co-design. 6M
   b. Explain with a neat block diagram, how source file to object file translation takes place. 8M
   c. Explain the different embedded firmware design approaches. 6M

Module-5

9. a. With neat diagram explain operating system architecture. 8M
   b. Differentiate between hard real time and soft real time operating system with a example for each. 4M
   c. Define process. Explain in detail the structure, memory organization and state transmission of the process. 8M

OR

10. a. Explain the Simulator and Emulator. 8M

    b. Write a note on message passing. 8M

    c. Explain the concept of deadlock with a neat diagram. 4M