CBCS SCHEME

Sixth Semester B.E. Degree Examination, Dec.2018/Jan.2019
ARM Microcontroller and Embedded Systems

Time: 3 hrs.   Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain architectural features of cortex M3 with block diagram. **(07 Marks)**
   b. Briefly describe the special registers of cortex M3. **(06 Marks)**
   c. What is stack and what are the instructions to access stack? **(03 Marks)**

OR

2 a. Briefly discuss features of built in nested vector interrupt controller. **(08 Marks)**
   b. Write a short note on :
      i) Debugging support
      ii) Interrupts and exceptions supported by cortex M3. **(08 Marks)**

Module-2

3 a. Explain memory map of cortex M3 with diagram. **(08 Marks)**
   b. Write C language program to toggle an LED with small delay in cortex M3. **(05 Marks)**
   c. Explain the 32 bit multiply instruction set. **(03 Marks)**

OR

4 a. Explain arithmetic instruction set with example. **(07 Marks)**
   b. Briefly explain shift and rotate instructions with diagrams. **(07 Marks)**
   c. Explain working of following instructions :
      i) CMP   ii) TST   iii) CMN   iv) REV. **(02 Marks)**

Module-3

5 a. Explain the sequence of operations for communicating with an I2C slave device. **(08 Marks)**
   b. Write the differences between :
      i) RISC and CISC
      ii) Harvard architecture and Von Neumann architecture. **(08 Marks)**

OR

6 a. Briefly explain PLDs and types of PLDs. **(06 Marks)**
   b. Write short note on :
      i) Optocoupler
      ii) COTS. **(08 Marks)**
   c. Explain working of DRAM. **(02 Marks)**

Module-4

7 a. List and explain characteristics of an embedded system. (06 Marks)
   b. Briefly describe any two operational and two non operational quality attributes. (08 Marks)
   c. Define and classify electronic control units. (02 Marks)

OR

8 a. Discuss fundamental issues in hardware software co-design. (08 Marks)
   b. Differentiate between DFG and CDFG with example. (04 Marks)
   c. Explain different types of serial interface buses deployed in automatic embedded application. (04 Marks)

Module-5

9 a. Define process and explain process states and states transition diagram. (07 Marks)
   b. Explain functional requirements to be analysed in selection of an RTOS. (06 Marks)
   c. Differentiate between threads and process. (03 Marks)

OR

10 a. Explain round robin scheduling technique. (03 Marks)
   b. Three process with process IDs P1, P2, P3 with estimated completion time 10, 5, 7 ms respectively enters ready queue together. A new process P4 with estimated completion time 2ms enters ready queue after 2ms. Calculate waiting time, turnaround time and average turnaround time with help of preemptive SJF scheduling. (10 Marks)
   c. Explain concept of pipe for IPC. (03 Marks)

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