CBCS SCHEME

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18EVE13

First Semester M.Tech. Degree Examination, Dec.2019/Jan.2020
Advanced Embedded Systems

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. What is an embedded system? Explain the different applications of embedded systems. **(10 Marks)**

b. Explain the different classifications of embedded systems. Give an example for each. **(10 Marks)**

OR

2 a. What is the difference between RISC and CISC processors? Give an example for each. **(08 Marks)**

b. Explain the role of reset circuit in embedded system. **(08 Marks)**

c. Explain the quality attribute response and throughout in the embedded system design. **(04 Marks)**

Module-2

3 a. What is hardware software co-design? Explain the fundamental issues in hardware software co-design. **(08 Marks)**

b. Explain the drawbacks of Assembly language based embedded firmware development. **(06 Marks)**

c. Explain in High level language based embedded firmware development **(06 Marks)**

OR

4 a. What is the difference between Data Flow Graph (DFG) and Control Data Flow Graph (CDFG) model? **(08 Marks)**

b. List the advantages of simulator based firmware debugging technique and explain. **(08 Marks)**

c. What is 'NULL' Pointer? Explain its significance in embedded C programming. **(04 Marks)**

Module-3

5 a. With a neat diagram, explain the architecture of ARM cortex M3 microcontroller. **(08 Marks)**

b. Explain the built in rested vectored interrupt controller in ARM cortex M3. **(08 Marks)**

c. Write a note on special registers and their functions in ARM cortex M3. **(04 Marks)**

OR

6 a. What is Stack? Explain the operation of stack push and POP. **(08 Marks)**

b. Write a note on reset sequence in ARM cortex M3. **(04 Marks)**

c. Explain link register and program counter in ARM cortex M3 **(08 Marks)**

Module-4

7 a. Write the syntax for UBFX and SBFX instructions and explain with an example. **(06 Marks)**

b. Explain saturation operations in assembly language of ARM Cortex M3. **(08 Marks)**

c. Write a note on MSR and MRS instruction in ARM Cortex M3. **(06 Marks)**

OR

8 a. Explain memory attributes in the Cortex M3 processor. (08 Marks)
b. Describe Bit – Band operations in ARM Cortex M3. (08 Marks)
c. Explain the 3 stage pipeline in the Cortex M3. (04 Marks)

Module-5

9 a. What can cause AHB error responses? (04 Marks)
b. Explain Interrupt enable and clear enable in ARM Cortex M3. (08 Marks)
c. What is the procedure to set up an interrupt in ARM Cortex with an example? (08 Marks)

OR

10 a. With an example, explain a typical Development flow using ARM development tools (08 Marks)
b. Write a C program to toggle an Light Emitting Diode (LED). (06 Marks)
c. Explain using exclusive access for semaphore operations with flow chart. (06 Marks)

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