CBCS SCHEME

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15EC62

Sixth Semester B.E. Degree Examination, June/July 2023
ARM Microcontroller & 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 the architecture of ARM Cortex–M3 processor with the help of neat block diagram. **(08 Marks)**

b. Describe the memory map of Cortex–M3 with neat diagram. **(04 Marks)**

c. List the applications of ARM processor. **(04 Marks)**

OR

2 a. Discuss the operating modes of cortex-M3 at different privelege levels. Depict the operating modes with state diagram. **(06 Marks)**

b. Explain two stack model of cortex–M3 with diagrams. **(04 Marks)**

c. Describe the special function registers of cortex-M3. **(06 Marks)**

Module-2

3 a. Explain the following instruction with examples :
i) ASR ii) LSL iii) ROR iv) REV. **(08 Marks)**

b. Briefly explain bit band operations and memory map of cortex M3. **(08 Marks)**

OR

4 a. Write a note on barrier instruction in cortex M3. **(06 Marks)**

b. With a diagram, explain the organization of CMSiS and its benefits. **(10 Marks)**

Module-3

5 a. Define the term RAM. Mention different types of RAM and explain any one with neat circuit diagram. **(06 Marks)**

b. With a neat interfacing diagram explain the SPI bus. **(06 Marks)**

c. Bring out differences between FPGA and CPLD. **(04 Marks)**

OR

6 a. Mention all the cores around which an embedded system is built. Discuss any two in detail. **(08 Marks)**

b. Write a note on embedded firmware. **(04 Marks)**

c. Explain the importance of brown out protection circuit with a neat diagram. **(04 Marks)**

Module-4

7 a. Explain the different characteristics of Embedded System. **(08 Marks)**

b. What is Non – operational quality attribute? Explain the important non – operational quality attribute to be considered in any embedded system design. **(08 Marks)**

OR

8 a. What is Hardware and Software Co-design? Explain the fundamental design approaches in detail. **(08 Marks)**

b. Differentiate : i) C – language Vs Embedded C ii) Compiler Vs Cross Compiler. **(08 Marks)**

Module-5

9 a. Define process. Explain in detail the structure, memory organization and state transitions of the process. **(08 Marks)**

b. Explain multi processing, multi tasking and multi programming. **(08 Marks)**

OR

10 a. Explain the simulator and emulator. **(08 Marks)**

b. Write a note on message passing. **(08 Marks)**

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