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20EVE13

First Semester M.Tech. Degree Examination, July/August 2022
Advanced Embedded System

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. What is Embedded System? Differentiate between Embedded and General computing system. **(06 Marks)**

b. Explain the different classifications of embedded systems with examples. **(10 Marks)**

c. List some examples of embedded systems. **(04 Marks)**

OR

2 a. List and briefly explain the quality attributes of embedded systems. **(10 Marks)**

b. Write a note on :
   i) Sensors and Actuators
   ii) Reset circuit. **(10 Marks)**

Module-2

3 a. What is embedded firmware? Explain the different embedded firmware design approaches. **(10 Marks)**

b. Explain the assembly language based embedded firmware development. And mention its advantages and disadvantages. **(10 Marks)**

OR

4 a. List the computational models in embedded design and explain data flow graph model and state machine model. **(10 Marks)**

b. List and explain the components in embedded system development (IDE). **(10 Marks)**

Module-3

5 a. Explain the architecture of ARM-Cortex-M3 with a simplified view diagram. **(10 Marks)**

b. What is Stack? Explain the operation of "PUSH" and "POP" in stack with example. **(10 Marks)**

OR

6 a. List and explain the ARM Cortex – M3 processor registers. **(10 Marks)**

b. Explain the reset sequence in ARM Cortex – M3. **(05 Marks)**

c. Write a note on Interrupts (NVIC), built in ARM Cortex – M3. **(05 Marks)**

Module-4

7 a. What is Pipelining? Explain the 3-state pipeline in ARM processor. **(06 Marks)**

b. Explain the following instructions of ARM Cortex – M3 with examples.
i) ADC ii) TST iii) SXTB iv) BL v) LDR. **(10 Marks)**

c. Write a note on assembler language basic syntax. **(04 Marks)**

OR

8 a. Explain the bus – interfaces on the ARM Cortex – M3. **(10 Marks)**

b. Write an assembly language program to calculate the sum of first ten numbers. **(06 Marks)**

c. Write a note on memory maps in ARM Cortex – M3. **(04 Marks)**

Module-5

9 a. List and explain the different types of exceptions in ARM Cortex – M3. **(10 Marks)**

b. Explain the basic interrupt configuration for ARM Cortex – M3. **(10 Marks)**

OR

10 a. Explain the systick timer. **(06 Marks)**

b. With a neat block diagram, explain the organization of CMSIS. **(10 Marks)**

c. Write a 'C' program to toggle a LED connected to ARM – Cortex – M3. **(04 Marks)**

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