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10CS72

Seventh Semester B.E. Degree Examination, Feb./Mar. 2022
Embedded Computing Systems

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART – A

- 1 a. Define embedded system. What are the characteristics and constraints of an embedded system? Explain. (08 Marks)
b. Discuss briefly the challenges faced in designing an embedded system. (07 Marks)
c. Mention and briefly explain the tools used in the development of embedded system. (05 Marks)
- 2 a. What is ARM? Explain the registers and instruction set of ARM processor with suitable example. (10 Marks)
b. Define the followings :
 - i) Supervisor mode
 - ii) Exception
 - iii) TRAP
 - iv) Coprocessor
 - v) Memory mapping
 - vi) Truncation and rounding errors. (10 Marks)
- 3 a. Explain the hardware device with internal vector address generation. (10 Marks)
b. What is DMA? Explain the working of DMA controller with a block diagram. (10 Marks)
- 4 a. Discuss the working of a timer/counter system and watch dog timer. (10 Marks)
b. Write and explain the DFG for an output Y_n of a FIR filter, where $Y_n = \sum a_i X_{n-i}$. (10 Marks)

PART – B

- 5 a. What is Kernel? List and explain the service provided by it. (10 Marks)
b. Discuss the different types of memory management strategies employed in RTOS. (10 Marks)
- 6 a. Explain the various IPC mechanisms that are needed to communicate among processor. (10 Marks)
b. How to evaluate the performance of an OS that considers the assumptions made for scheduling policies. (10 Marks)
- 7 a. Explain the power management and optimization for processes that help to manage the systems power consumption. (10 Marks)
b. Describe the significant functional and non-functional requirements that need to be analyzed in selection of an RTOS for an embedded system design. (10 Marks)
- 8 a. Write short notes on the following :
 - i) IDE ii) Simulator (10 Marks)
b. Discuss the various Target hardware debugging tools in embedded product development. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. $42+8=50$, will be treated as malpractice.