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Total No. of Pages : 02

Total No. of Questions : 08

M.Tech.(VLSI D)(2016 & Onwards) (Sem.-2)

EMBEDDED SYSTEMS

Subject Code : MTVL-203

M.Code : 74260

Time : 3 Hrs.

Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWENTY marks.

1. a. What are the essential units and important characteristics of an embedded system? Explain purpose of each unit in embedded system. Justify your answer with suitable examples. 10
b. Describe and compare the characteristics of various application specific instruction set processors (ASIPS). 10
2. Explain the following components of embedded system hardware : 20
Serial protocols I2C, Parallel protocol PCI bus, LCD controllers, Pulse width modulators and Watch dog timers. Give suitable example of each. Draw suitable block diagram.
3. a. What is real time operating system (RTOS)? Draw its state transition diagrams. Give two examples. What is kernel? Explain three broad categories of kernel. 15
b. Discuss the design trade-offs due to thermal consideration and effects of EMI/ES. 5
4. Explain the concept of interfacing of processor with input and output device. Do the comparison between IO mapped I/O, Memory mapped I/O, and Standard I/O interrupts. 20
5. What is Cache mapping? Explain three different Cache mapping techniques in detail. How the concepts of composing memories are used in embedded system? Illustrate this concept by taking a suitable example. 20

6. a. While calling the Interrupt sub-routine (ISR), the storing and restoring of the state may consume many clock cycles, and is thus somewhat inefficient. Explain how the I/O method of direct memory access (DMA) eliminates these inefficiencies. Also, explain the DMA controllers. 10
- b. Explain serial communication using I2C, CAN and USB in detail. 10
7. Explain how memory hierarchy and cache are used in embedded system? Briefly define each of the following common memory used in embedded system: PROM, flash EEPROM, RAM, DRAM, and mask-programmed ROM. 20
8. a. Describe the following keys steps involve in the development process of an embedded system : Design of system architecture, Operating system selection, selection of development platform and Coding optimization issue. 12
- b. Explain different methods of testing and debugging embedded system software. 8

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.