2nd Sem VLSI

USN | | | | | | | | | | |

12EC116

M.Tech. Degree Examination, June/July 2014

Advanced Microcontrollers

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. Explain essential components of a microcontroller with a neat diagram. **(10 Marks)**
b. With a neat block diagram, explain the architecture of MSP430. **(10 Marks)**

2 a. Explain the different addressing modes of MSP 430. **(07 Marks)**
b. What is meant by emulated instructions? **(03 Marks)**
c. Explain the following instructions of MSP 430, with suitable examples:
i) BIT.W SRC, DEST
ii) SXT DEST
iii) JGE LABEL
iv) DADC.W SRC, DEST
v) DINT **(10 Marks)**

3 a. Explain interrupt capability of ports P1 and P2. Explain associated registers of MSP 430. **(05 Marks)**
b. Explain interrupt processing in MSP 430. **(05 Marks)**
c. Briefly explain Timer_A operation modes. **(10 Marks)**

4 a. With a neat block diagram explain the operation of ADC10 module of MSP 430 microcontroller. **(10 Marks)**
b. Briefly explain the features of watchdog timer in MSP 430. **(05 Marks)**
c. Describe the DMA of MSP 430. **(05 Marks)**

5 a. With neat block diagram, explain the architecture of Cortex M3 processor. **(10 Marks)**
b. Give a overview of registers with their function, in CORTEX M3 processor. **(10 Marks)**

6 a. Explain the different operation modes and prevelege levels in cortex M3. Using timing diagrams explain switching the processor modes. **(10 Marks)**
b. List and explain the functions of Nested Vectored Interrupt Controller (NVIC) registers used in interrupt handling. **(06 Marks)**
c. Explain tail-chaining of exceptions and late arrival exception behaviour. **(04 Marks)**

7 a. Explain the following operations in cortex M3 when interrupt is used
i) Stack set up
ii) Vector table set up
iii) Interrupt priority set up
iv) Enable the interrupt **(10 Marks)**
b. Describe the advanced programming features of Cortex-M3. **(10 Marks)**

8 a. With a flow chart, explain the steps used to set up the MPU in cortex M3. **(05 Marks)**
b. Write short notes on wireless sensor networking using MSP 430. **(10 Marks)**
c. Explain PWM generation in MSP 430. **(05 Marks)**

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