

R19

Code No: 5677AB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech I Semester Examinations, January - 2020

MICROCONTROLLERS AND PROGRAMMABLE DIGITAL SIGNAL PROCESSORS
(Embedded Systems and VLSI Design)

Time: 3hrs

Max.Marks:75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

5 × 5 Marks = 25

- 1.a) Explain the multiple register transfer instruction set of ARM processor. [5]
- b) Illustrate different Registers and Special Registers in Cortex M3 processor. [5]
- c) List out the Features of WDT in LPC 17XX Microcontroller. [5]
- d) Draw the Harvard architecture of DSP processor. [5]
- e) Write the various parts of DSP TMS320C6000 processor. [5]

PART - B

5 × 10 Marks = 50

2. Explain in detail special registers used in ARM cortex M3 processor. [10]
- OR**
- 3.a) Mention the instructions used for accessing the special registers. Explain same using suitable example.
 - b) Explain shift and rotate instructions used in ARM cortex M3 instruction set. Why is there rotate right instruction but no rotate left instruction in cortex M3? [5+5]
4. In addition to the normal 32-bit instructions, ARM processor cores can execute 16-bit Thumb instructions. Moreover, the Jazelle cores can even executes Java byte codes. Justify the presence of each of the additional instruction types in the ARM processor.
Answer the following questions in a few lines each.
 - a) How do you enter the Thumb mode from the ARM mode and vice versa?
 - b) List the reason(s) for which the FIQ interrupt can be handled faster than the IRQ interrupt in ARM?
 - c) What do you mean by banking of registers in ARM and how does it contribute to improve its performance? ARM has three architectural profiles: the Application profile targeted at high. [10]
- OR**
5. Explain about Service Call and nested Vectored Interrupt Controller of ARM Cortex-M3 processor. [10]

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6.a) Briefly explain about RTC in LPC 17XX Microcontroller.

b) Describe the Features and benefits of LPC 17XX Microcontroller. [5+5]

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7. List out the Features of ADC and UART in LPC 17XX Microcontroller. [10]

8. Briefly describe the Barrel shift register and Multi port memory of programmable DSP processors. [10]

OR

9.a) List the features of programmable DSP processors.

b) Explain with neat diagram of TI DSP processor family. [5+5]

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10. Draw the block diagram of VLIW processor and explain the assembly instructions memory addressing of VLIW processor with examples. [10]

OR

11. Explain various addressing modes of a digital signal processor TMS320C6000 series. [10]

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