21EC52

Fifth Semester B.E./B.Tech. Degree Examination, June/July 2025
Computer Organization and ARM Microcontrollers

Time: 3 hrs.   Max. Marks: 100

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

Module-1

1   a. Explain the performance of a processor
        i) Processor clock   ii) Basic performance equation   iii) Clock rate.   **(06 Marks)**
    b. Discuss the 8-bit parallel port input interface circuit with a neat diagram.   **(08 Marks)**
    c. Explain the PCI bus in brief for read operation along with the timing diagram.   **(06 Marks)**

OR

2   a. Describe the various addressing modes give one example for each mode.   **(10 Marks)**
    b. With respect to handling interrupts from multiple devices, explain
        i) interrupt priority   ii) daisy chain method.   **(10 Marks)**

Module-2

3   a. Explain in detail the synchronous DRAM structure with a neat diagram.   **(10 Marks)**
    b. Describe the hardwired computer with an example.   **(10 Marks)**

OR

4   a. Explain with a neat diagram fetching a word from memory and storing a word in memory.   **(10 Marks)**
    b. Explain the single bus organization of the data path inside a processor with a neat diagram.   **(10 Marks)**

Module-3

5   a. Explain an ARM based embedded device with a neat diagram and also discuss the AMBA bus protocols.   **(10 Marks)**
    b. What is CPSR? Explain the banked registers in detail.   **(10 Marks)**

OR

6   a. Explain the ARM core dataflow model with a neat diagram and also discuss the ARM registers.   **(10 Marks)**
    b. Explain the conditional code flag in ARM processor.   **(05 Marks)**
    c. Differentiate between Von Neumann architecture and Harvard architecture.   **(05 Marks)**

Module-4

7   a. What is Barrel shifter? Explain all the Barrel shifter instructions with an example for each instruction.   **(10 Marks)**
    b. Explain the following instructions with syntax and give an example for each
        i) LDM   ii) STMIA   iii) ADR   iv) BIC   v) SWI.   **(10 Marks)**

OR

8	a.	Explain the program status register instructions in detail. Give one example for each instruction.	**(05 Marks)**
	b.	Illustrate the pre-indexing and post indexing instruction of ARM.	**(05 Marks)**
	c.	Explain the following instruction with syntax give a example for each i) MLA ii) BL iii) LDRB iv) STRH v) SWP.	**(10 Marks)**

Module-5

9	a.	Explain the three C looping structures in detail.	**(10 Marks)**
	b.	Explain the basic C data types in detail.	**(05 Marks)**
	c.	Write an ALP to find the sum of first 10 integer numbers.	**(05 Marks)**

OR

10	a.	What are the issues that encounter when porting C code to the ARM code.	**(05 Marks)**
	b.	Write an ALP to find the largest number in an array of 32 numbers.	**(05 Marks)**
	c.	Write a note on : i) Pointer Aliasing ii) Bit Fields.	**(10 Marks)**

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