Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SIXTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MAY 2019

Course Code: AE308
Course Name: ADVANCED MICROPROCESSORS

Max. Marks: 100 Duration: 3 Hours

PART A
Answer any two full questions, each carries 15 marks.

Marks

1	a)	Define and differentiate CISC and RISC. Give examples to each.	(7)
	b)	Describe the evolution of ARM processors from Acorn RISC Machine to Advanced RISC Machine	(5)
	c)	What is the significance of letter 'T' in ARM7TDMI? Explain the features.	(3)
2	a)	What are the physical features that have driven the design of ARM processor?	(3)
	b)	What are the privileged and un-privileged modes possible in ARM processor? Explain each mode with its significance.	(6)
	c)	Explain the core extensions found with the ARM core?	(6)
3	a)	Compare ARM Processor family	(4)
	b)	What are the features that make the ARM instruction set different from the pure RISC definition?	(4)
	c)	Draw and explain the complete ARM register set.	(7)

PART B
Answer any two full questions, each carries 15 marks.

4	a)	Write an ALP for swapping register contents.	(7)
	b)	What are assembler directives AREA, RN and EQU? Give their syntax and examples.	(5)
	c)	What is the need for multiply long instructions in ARM, How it works?	(2)
5	a)	Let	(5)

$$r0 = 0x00000000$$
$$r1 = 0x00009000$$
$$mem32[0x00009000] = 0x01010101$$
$$mem32[0x00009004] = 0x02020202$$

Identify the index method and show the contents of r0 and r1 in each of the following.

        i.   LDR   r0, [r1, #4]

        ii.   LDR   r0, [r1, #4] !

        iii.   LDR   r0, [r1], #4

  b)   Explain the basic data types in C   (5)

  c)   What are the program status register instructions? Give an example that enables   (6)
       IRQ interrupts.

6 a)   Write a C program for general purpose I/O.   (10)

   b)   How can we arrange a structure efficiently in a C program?   (4)

   c)   What is mean by loop unrolling?   (1)

PART C
Answer any two full questions, each carries 20 marks.

7 a)   Explain the memory management unit of ARM.   (12)

   b)   Both the software interrupt and undefined instruction exceptions have the same   (3)
       priority. Why?

   c)   Draw the diagram that maps each exception with its corresponding mode.   (5)

8 a)   Draw the typical ARM based microcontroller and explain the significance of (15)
       AMBA bus.

   b)   What is the significance of translation table base address? How it is obtained?   (2)

   c)   What is TLB? Explain its function.   (3)

9 a)   What are the different types of page tables? Give their features.   (6)

   b)   Draw and explain the page table walk that used for converting a 1MB page to a (6)
       corresponding page frame.

   c)   What is the key function of FCSE? How it works?   (8)

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