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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

February 2025 Semester End Main Examinations

Programme: B.E.

Semester: IV

Branch: ES Cluster (EEE/ET/ECE/EIE/MD)

Duration: 3 hrs.

Course Code: 22ES4PCAPP

Max Marks: 100

Course: Arm Processor and Programming

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I			CO	PO	Marks
1	a)	Draw the basic processing units of a computer and explain in brief.	<i>CO1</i>	-	10
	b)	Describe the concept of pipeline with an example	<i>CO1</i>	-	10
OR					
2	a)	List the different types of computer peripherals and explain in brief	<i>CO1</i>	-	10
	b)	(i) Distinguish between cache memory and virtual memory (ii) Distinguish between RISC and CISC	<i>CO1</i>	<i>PO1</i>	10
UNIT II					
3	a)	Draw the ARM core dataflow model and describe its components	<i>CO1</i>	-	10
	b)	Write a ALP to illustrate ARM-THUMB interworking	<i>CO2</i>	<i>PO1</i>	05
	c)	Write a ALP to find the sum of first 10 natural numbers	<i>CO2</i>	<i>PO1</i>	05
OR					
4	a)	Differentiate between RISC and CISC machine	<i>CO1</i>	-	06
	b)	Illustrate arithmetic operations using suitable ARM instruction sets.	<i>CO2</i>	<i>PO1</i>	08
	c)	Write a ALP to find the greatest number in a given series of numbers.	<i>CO2</i>	<i>PO1</i>	06
UNIT III					
5	a)	What is loop unrolling? Explain with an example C code	<i>CO1</i>	-	07
	b)	Describe load scheduling by preloading with an example assembly program	<i>CO1</i>	-	07
	c)	Write assembly codes for the following C functions given below			06

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
Revealing of identification, appeal to evaluator will be treated as malpractice.

```

int checksum_v1(int *data)
{
    char i;
    int sum=0;

    for (i=0; i<64; i++)
    {
        sum += data[i];
    }
    return sum;
}

```

OR

6 a) Describe how to efficiently optimize the loops in case of assembly programming

6 b) Explain instruction scheduling with an example.

6 c) Describe mixing of C and assembly codes using an embedded assembler.

UNIT - IV

7 a) Illustrate PUSH and POP operations using a stack

7 b) Illustrate enabling and disabling IRQ exceptions.

OR

8 a) Illustrate enabling and disabling FIQ exceptions.

8 b) Write a block diagram illustrating exceptions and associated processor modes. Also explain in brief.

UNIT - V

9 a) List the features of LPC 2148 and explain their use in brief.

9 b) Write a program to generate triangular wave using DAC of LPC 2148

OR

10 a) Write a program to generate square wave using DAC of LPC 2148

10 b) List and explain the important components of embedded operating system.
