KUMARAGURU
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B.E DEGREE EXAMINATIONS: NOV/DEC 2024

(Regulation 2018)

Fifth Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U18ECI5206: Embedded Processor Architecture

COURSE OUTCOMES

CO1: Recall the concepts of the Microprocessor and its variants.

CO2: Explain the architecture of ARM7 embedded processor.

CO3: Explain the ARM7 ISA and illustrate assembly level programming.

CO4: Explain the organization concepts of the embedded processor.

CO5: Explain the BUS architectures involved with ARM processor.

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	Differentiate between Von-neumann vs Harvard Architecture	CO1	[K2]
2.	What is Single Tasking. Give examples for Single Tasking applications.	CO1	[K2]
3.	Summarize the fields of CPSR register.	CO2	[K1]
4.	List the five conditional codes with examples.	CO2	[K1]
5.	Develop an ARM assembly program to multiply two 32-bit binary numbers.	CO3	[K3]
6.	List the data transfer instructions of ARM processor.	CO3	[K1]
7.	Illustrate the flowchart for non-restoring algorithm.	CO4	[K2]
8.	Sketch the hardware structure required for implementation of the Booth's multiplications algorithm.	CO4	[K2]
9.	Design a bi-directional bus architecture.	CO5	[K2]
10.	Define ARMulator.	CO5	[K2]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	List the difference between RISC and CISC machines.	8	CO1	[K2]

	b)	With a neat diagram, explain the structure of a computer architecture.	8	CO1	[K$_2$]
12.		Illustrate in detail about the Architecture of ARM processor.	16	CO2	[K$_2$]
13.	a)	Develop an Assembly language code to find the number of ones and zeros from a given 32-bit number.	8	CO3	[K$_3$]
	b)	Explain the ARM-Thumb Interworking with a neat diagram.	8	CO3	[K$_3$]
14.	a)	Sketch the hardware structure required for the implementation of the restoring division algorithm.	6	CO4	[K$_2$]
	b)	Summarize the different types of Memories.	10	CO4	[K$_2$]
15.	a)	Explain how the ARM processor interacts with different types of memory	8	CO5	[K$_2$]
	b)	With neat sketch, explain the Advanced Microcontroller Bus Architecture (AMBA).	8	CO5	[K$_2$]
16.	a)	With a neat diagram, explain the three-stage and five stage pipelining process of the ARM processor? How the throughput can be increased with the pipelining process?	10	CO4	[K$_2$]
	b)	Summarize the types of data hazards. Explain each with an example.	6	CO4	[K$_3$]

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