

Model Question Paper-1 with effect from 2018-19 (CBCS Scheme)

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Fourth Semester B.E. Degree Examination Microcontroller and Embedded Systems

TIME: 03 Hours

Max. Marks: 100

Note: Answer any five full question, choosing ONE full question from each module

Module -1			*Bloom's Taxonomy Level	Marks
Q.01	a	Differentiate between RISC and CISC processors.	L1	05
	b	Explain the major design rules to implement the RISC philosophy.	L2	05
	c	Explain ARM core data flow model with neat diagram.	L2	10
OR				
Q.02	a	Explain the programmer's model of ARM processors with complete register sets available.	L2	04
	b	With the help of bit layout diagram explain current program status register of ARM.	L2	06
	c	What is pipeline in ARM? Illustrate with an example. Show the pipeline stages of ARM7, ARM9 and ARM10.	L2	10
Module-2				
Q. 03	a	Write and explain arithmetic instructions with respect to the ARM processor	L2	06
	b	Discuss the load & store instructions with respect to the Single Register Transfer	L2	08
	c	Explain briefly co-processor instructions of ARM processor.	L2	06
OR				
Q.04	a	Design ARM assembly language program to perform the addition and multiplication of two 32 bit numbers.	L3	04
	b	Define instruction scheduling? Explain the rules summarizing the cycle timings for common instruction classes on the ARM9TDMI.	L2	06
	c	Explain the scheduling of following instructions with respect to the ARM9TDMI pipeline implementation, i) STR ii) LDRH iii) B Label	L3	10
Module-3				
Q. 05	a	Differentiate Embedded systems and General purpose computing systems.	L1	04
	b	What are the major application areas of Embedded systems? Explain the various purposes of embedded systems.	L2	06
	c	Explain the system core of the Embedded systems.	L2	10
OR				
Q. 06	a	Explain the interfacing of following I/O subsystems with Embedded systems i) 7-Segment LED Display ii) Stepper Motor.	L2	10
	b	Write a short note on onboard communication interfaces in Embedded systems	L2	06
	c	Explain the oscillator unit of the Embedded system.	L1	04
Module-4				
Q. 07	a	Explain the characteristics of Embedded systems.	L1	04
	b	Explain the operational and non-operational quality attributes of Embedded systems.	L2	06
	c	With the functional block diagram, explain the operation of Washing Machine as Application-Specific Embedded system.	L2	10
OR				

Q. 08	a	Explain the fundamental issues in Hardware Software co-design.	L1	04
	b	Design & explain FSM model for automatic seat belt warning system.	L3	06
	c	Explain two basic approaches for designing Embedded Firmware.	L2	10
Module-5				
Q. 09	a	Explain two different approaches for building an operating system kernel.	L2	06
	b	Define the terms Task, Process and Threads? Explain the Process structure, process states and state transitions.	L2	10
	c	Explain the different types of multitasking.	L1	04
OR				
Q. 10	a	Explain the task communication/synchronization issues.	L2	08
	b	Explain the functional and non-functional requirements to be considered while choosing an RTOS for an Embedded design.	L2	08
	c	Write a note on an emulator and debugging techniques.	L1	04

*Bloom's Taxonomy Level: Indicate as L1, L2, L3, L4, etc. It is also desirable to indicate the COs and POs to be attained by every bit of questions.