CBCS SCHEME

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BEC/BTE/BVL601

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025
Embedded System Design

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	What is Embedded System? List the applications of Embedded System.	06	L2	CO1
	b.	Give the difference between microcontroller and Microprocessor	06	L2	CO1
	c.	Explain about opto coupler and Push button switch with neat diagram	08	L2	CO1
		OR			
Q.2	a.	Give the classification of Embedded System with examples.	06	L2	CO1
	b.	Give the difference between Von-Neumann and Harvard Architecture.	06	L2	CO1
	c.	Explain Piezo buzzer, sensor and actuators in embedded system with neat diagram.	08	L2	CO1
		Module – 2			
Q.3	a.	Explain the characterstics and quality attributes of Embedded System.	06	L2	CO2
	b.	Explain the working of washing machine with a neat functional diagram	06	L2	CO2
	c.	Design and automatic tea/coffee vending machine based on FSM model.	08	L3	CO2
		OR			
Q.4	a.	Explain operational and non operational attributes of embedded systems.	06	L2	CO2
	b.	Explain the hardware and software co-design in embedded system.	06	L2	CO3
	c.	With the help of FSM model, explain the system design and operation of automatic seat belt warning.	08	L2	CO3
		Module – 3			
Q.5	a.	Explain monolithic and microkernel with suitable example for each.	06	L2	CO3
	b.	Explain different conditions that favour deadlock.	06	L2	CO3
	c.	Describe pre-entire SIF scheduling and calculate all the performance factors.	08	L2	CO3
		OR			
Q.6	a.	Explain task, process and threads in ARM processor.	06	L2	CO3
	b.	With a diagram explain the concept of counting semaphore with an example.	06	L2	CO3
	c.	Explain the IDE environment for embedded system design with a neat block diagram	08	L2	CO3
		Module – 4			
Q.7	a.	Explain the functions of various units in ARM cortex M_3 processor architecture in brief.	08	L2	CO4
	b.	Explain the various interrupts and exception along with the vector address	06	L2	CO4
	c.	Explain the ARM core data flow model with a neat diagram.	06	L2	CO4
		OR			
Q.8	a.	Explain program status register in cortex M_3 alog with vector address	08	L2	CO4
	b.	Explain any five applications of ARM cortex M_3 based on its features	06	L2	CO4
	c.	With adiagram, explain two operation modes and privilege levels in cortex M_3	06	L2	CO4

		Module – 5			
Q.9	**a.**	Write an ALP to add the first 10 integer number using cortex M_3 processor	**06**	**L2**	**CO5**
	b.	Explain shift and rotate instruction of CORTEX M_3 with examples	**06**	**L2**	**CO5**
	c.	Describe CMSIS with diagram and its functions.	**08**	**L2**	**CO5**
		OR			
Q.10	**a.**	Explain 16 – bit instructions with example. a) ADD b)CMP c)ASR	**06**	**L2**	**CO5**
	b.	Write an assembly language to determine the parity of 32 bit number.	**06**	**L2**	**CO5**
	c.	Explain 32 bit instruction with example a) ADC b)BFC c)LSL d) PUSH	**08**	**L2**	**CO5**

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