

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 characteristics 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-emptive 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 along 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 a diagram, explain two operation modes and privilege levels in cortex M ₃	06	L2	CO4
1 of 2					

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
