Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 7022

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – MAY / JUNE 2024
Fifth Semester
Electronics and Communication Engineering
U19ECE06 / U19ECV41 – EMBEDDED SYSTEM DESIGN AND REAL TIME APPLICATIONS
(Regulation 2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	What are the applications of embedded system?	2	K1	CO1
2.	Distinguish between the Memory mapped & I/O mapped I/O.	2	K2	CO1
3.	Identify the role of watch dog timer in microcontroller.	2	K2	CO2
4.	Mention the need of low power embedded systems.	2	K1	CO2
5.	What are the different modes of Real Time Clock?	2	K1	CO3
6.	State the function of PWM module.	2	K1	CO3
7.	What is the difference between host and target system?	2	K2	CO4
8.	Draw the block diagram to interface keyboard with ARM cortex M4.	2	K1	CO4
9.	What are the different development approaches in RTOS?	2	K1	CO5
10.	Define thread and process.	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.			Questions	Marks	KL	CO
11.	a)	i.	Explain the basic processors and hardware units in the embedded system.	7	K2	CO1
		ii.	Compare CISC vs. RISC architectures.	6	K2	CO1

			(OR)			
	b)	i.	Explain the instruction formats and various addressing modes of ARM cortex M4.	7	K2	CO1
		ii.	Explain the Von-Neumann and Harvard architecture.	6	K2	CO1
12.	a)	i.	Explain the Fixed point and floating point arithmetic operation.	7	K2	CO2
		ii.	What are memory mapped peripherals? Explain briefly.	6	K2	CO2
			(OR)			
	b)	Explain the following:				
		i.	Hibernation Module on Tiva	7	K2	CO2
		ii.	GPIO in Tiva Launchpad	6	K2	CO2
13.	a)	With necessary interfacing diagram, elaborate on timer and real time clock interfacing.		13	K2	CO3
			(OR)			
	b)	Explain the block diagram of PWM and Quadrature Encoder interface (QEI) and explain the functions of each block.		13	K2	CO3
14.	a)	Explain the following:				
		i.	In-System Programming (ISP).	7	K2	CO4
		ii.	In-Application Programming (IAP).	6	K2	CO4
			(OR)			
	b)	Explain in detail about Embedded Software into Target System.		13	K2	CO4
15.	a)	i.	What is a mail box? How does a mailbox pass a massage during inter process communication?	6	K2	CO5
		ii.	What is meant by a pipe? How does a pipe may differ from a queue?	7	K2	
			(OR)			
	b)	i.	How does use of a counting semaphore differ from a Mutex?	6	K2	CO5
		ii.	Explain about Multitasking OS and Multitasking scheduler.	7		

PART – C

(1 x 15 = 15 Marks)

Q.No.			Questions	Marks	KL	CO
16.	a)	Elaborate the product design life cycle with an example.		15	K2	CO5
			(OR)			
	b)	i.	What are the factors to be considered for selecting a processor during the system design phase?	7	K2	CO5
		ii.	With suitable example, explain product design life cycle.	8	K2	