Reg. No.															

Question Paper Code	13593

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Sixth Semester

Electronics and Instrumentation Engineering

(Common to Instrumentation and Control Engineering)

20EIPC602 - EMBEDDED SYSTEMS

Regulations - 2020

Duration: 3 Hours Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	*K – Level*	*CO*
1.	Which of these designs considers both the software and hardware during the embedded design? (a) Peripheral Design (b) Platform-Based Co design (c) Software/Hardware Design (d) Memory Design	*1*	*K1*	*CO1*
2.	Restarting a Watchdog timer is known as _____ (a) Pushing (b) Pulling (c) Kicking (d) Picking	*1*	*K1*	*CO1*
3.	Which of the following can be used for long distance communication? (a) I^2C (b) Parallel Port (c) SPI (d) RS232	*1*	*K1*	*CO2*
4.	Two wire interface is also called as _____ (a) UART (b) SPI (c) I^2C (d) USART	*1*	*K1*	*CO2*
5.	What does a Data Flow Graph (DFG) primarily model? (a) The control flow of a program (b) The data flow within a system (c) The state transitions of a system (d) The sequence of operations in a workflow	*1*	*K2*	*CO3*
6.	What is the primary purpose of a state machine model? (a) To model data flow within a system (b) To describe the behavior of a system as it transitions between states (c) To represent the hierarchical structure of a system (d) To visualize the sequence of operations in a workflow	*1*	*K2*	*CO3*
7.	Which of the following is the primary advantage of using an RTOS in embedded system design? (a) Increased power consumption (b) Reduced complexity of software development (c) Improved real-time performance and predictability (d) Simpler hardware interface requirements	*1*	*K2*	*CO4*
8.	What is the purpose of a task scheduler in an RTOS? (a) To manage the physical memory of the system. (b) To manage the flow of data between different devices. (c) To determine which task should run and when. (d) To handle all the interrupts generated by the system.	*1*	*K1*	*CO4*
9.	What is the primary function of the IoT device's embedded system? (a) To facilitate useful experiences as part of the device's interface. (b) To facilitate communication between the device and its end user. (c) To facilitate communication between the sensor and the network. (d) To facilitate faster performance, depending on network connection.	*1*	*K2*	*CO5*
10.	Which of the following is not an IoT device? (a) Table (b) Laptop c) Arduino (d) Tablet	*1*	*K1*	*CO5*

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11.	Explain the functional requirements of Embedded System.	2	K2	CO1
12.	How embedded systems are classified?	2	K1	CO1
13.	Discuss the two essential units of a processor on an embedded system.	2	K2	CO1
14.	Differentiate between Synchronous and Asynchronous communication.	2	K2	CO2
15.	List out the features of RS-485 standard.	2	K1	CO2
16.	Explain about CAN bus. Where is it used?	2	K2	CO2
17.	What are the objectives of EDLC?	2	K1	CO3
18.	Define sequential Programming Model.	2	K1	CO3
19.	Explain the need of RTOS in the Embedded system.	2	K2	CO4
20.	What is Task scheduler?	2	K1	CO4
21.	Compare the difference between the Internet of Things (IoT) and Machine to Machine (M2M).	2	K2	CO5
22.	What are the major Privacy and Security Issues in case of Internet Of Things?	2	K1	CO5

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a) (i)	Illustrate with neat diagram about the functional unit of embedded processor.	8	K2	CO1
	(ii)	Write the types of timers and explain any two types of timers.	3	K2	CO1
		OR			
	b)	Describe in detail about the data transfer mechanism using DMA in Embedded System.	11	K2	CO1
24.	a) (i)	Define port and explain the various types of serial and parallel ports.	7	K2	CO2
	(ii)	What is SPI protocol and describe its interface?	4	K2	CO2
		OR			
	b)	Describe the architecture, message formats and error detection in CAN protocol.	11	K2	CO2
25.	a)	Write the steps involved in describing a system's behavior as a state Machine.	11	K2	CO3
		OR			
	b)	Explain in detail about the different phases of EDLC with necessary diagram.	11	K2	CO3
26.	a)	Explain any three types of inter process communication functions between the tasks.	11	K2	CO4
		OR			
	b)	Discuss about pre-emptive and non pre-emptive scheduling with suitable diagram.	11	K2	CO4
27.	a)	Explain in detail about the various IoT protocol stacks used in the layered architecture.	11	K2	CO5
		OR			
	b)	Explain the Physical Design of IoT and Logical Design of IoT with function block diagram.	11	K2	CO5
28.	a) (i)	Explain in detail about semaphores and its applications.	6	K2	CO4
	(ii)	Illustrate with suitable diagram about the IoT architecture and its functional element.	5	K2	CO5
		OR			
	b) (i)	Explain in detail about priority inversion.	6	K2	CO4
	(ii)	Discuss about IoT based Smart Irrigation with examples.	5	K2	CO5