Unit–I

Chapter 1 : Introduction to Embedded Systems 1-1 to 1-12

Syllabus : Block diagram of embedded system with hardware components, Harvard and Von-neumann architecture, RISC and CISC processors, Features of 89C51, PIC, AVR and ARM microcontrollers with their applications, Characteristics of embedded system processor power, memory, operating system, Reliability, performance, power consumption, NRE cost, Unit cost, Size, Flexibility, Time-to-prototype, Time-to-market, Maintainability, Correctness and safety, Classification of embedded system : small scale, Medium scale, Sophisticated, Stand-alone, Reactive/real time (soft and hard real time).

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- **Review Questions 1-12**

Unit–II

Chapter 2 : Programming using Embedded 'C' 2-1 to 2-30

Syllabus : Programming with 'Embedded C': Arithmetic and logical operations. Data transfer with memory and port, Decision control and looping, Timer / Counter program using 'embedded C' for given microcontroller, Serial communication program using 'embedded C' for given microcontroller, Interrupt control program with 'embedded C' for given microcontroller.

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• **Review Questions 2-30**

Unit–III

Chapter 3 : Communication Standards and Protocols **3-1 to 3-20**

Syllabus : Modes of the data communication : Serial, Parallel, Synchronous and synchronous communication, Serial communication standards : RS232, MAX232 as bidirectional level converter, Communication protocols. i. Serial communication protocols : I2C, CAN, USB, Serial peripheral interface (SPI), Synchronous serial protocols (SSP), ii. Parallel communication protocols : PCI, PCI-X, Features of advanced serial protocol IrDA, Bluetooth, Zigbee.

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Unit–IV

Chapter 4 : Interfacing Input and Output Devices **4-1 to 4-34**

Syllabus : Interface the various input, Output and special devices to the microcontroller 89C51 / AVR, Output Devices : LED, LCD, Relays, 7-segment displays, Multiplex 7-segment display, Input Devices : Key, Matrix keyboard, Motor : Stepper motor, DC motor, ADC / DAC : 8 bit ADC / DAC (0808 / 09), Sensor : Temperature sensor (LM35).

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- **Review Questions 4-34**

Unit–V

Chapter 5 : Real Time Operating Systems 5-1 to 5-15

Syllabus : Operating system : General and real time operating system, Characteristics of real time operating system : Consistency, Reliability, Scalability, Performance, Predictability, Functions of RTOS : i. Task management : Inter task communication and multitasking. ii. Scheduling : Scheduling algorithms. iii. Resource allocation and interrupt handling, Features of RTOS : Watchdog timer, Semaphore, Deadlock : i. Reason of occurrence. ii. Handling of deadlock detection, Prevention, Ignoring.

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