

**Time : 3 hrs**  
**Total Marks: 100**

1. a) With a neat diagram explain the operation of a typical embedded system with all design constraints (10)  
b) Explain the working of RS232 interfaced with 8051 Microcontroller (10)  
**OR**
2. a) How to interface two LEDs in microprocessor and microcontroller? Explain using necessary diagrams (10)  
b) What are the characteristics of an embedded system? (8)  
c) Define Embedded System (2)
3. Explain the serial communication operation of 8051 microcontroller with neat diagrams (20)  
**OR**
4. a) Write an embedded c program to operate a SPDT relay connected with 8051 microcontroller. And Explain the operation with a neat block diagram.(12)  
b) List and elaborate the handshaking signals of RS232 (8)
5. Design an elevator system which has 3 floors. In each floor there is a biometric sensor is available to call the vehicle. No button system is there. Only the registered persons can operate the elevator none of the other persons can use it. Write an embedded c program to do this operation in a very smooth manner with a circuit diagram, flowchart and algorithm. (20)  
**OR**
6. a) With a neat block diagram, explain the Timer0 operation of 8051 along with the registers.(10)  
b) Discuss how DC motor is interfaced with 8051 microcontroller with necessary diagrams (10)
7. a) Elucidate the importance of RTC and explain the interfacing of RTC using 8051 microcontroller (12)  
b) Draw the internal diagram of MAX232 and explain (8)  
**OR**
8. a) What is the need for IDE in an Embedded Architecture? Discuss (6)  
b) Differentiate synchronous and asynchronous communication (6)  
c) Define protocols? Elucidate the types of protocols which is used in embedded communications (8)
9. a) Define semaphore and explain the various types of semaphores used in embedded system with neat diagrams (12)  
b) Mention the importance of scheduling in the RTOS system (8)

**Wishing you All the Best**