

Reg No.....  
Name.....

**SEVENTH SEMESTER B TECH DEGREE EXAMINATION**  
**ELECTRICAL AND ELECTRONICS ENGINEERING**  
**MODEL QUESTION PAPER**

**13.701 EMBEDDED SYSTEMS (E)**

Time: 3 Hours

Maximum: 100 marks

**Part A**

**(Answer all questions from part A)**

1. Explain main features of an embedded system with the help of examples
2. Describe the main assembler directives of 8051 microcontroller
3. Explain the different data types available in embedded C
4. Differentiate the various modes of operation of timers in 8051
5. Draw the timing diagram explaining the operation of ADC 0804

(5 x 4 = 20 marks)

**Part B**

**(Answer any one question from each module (20x4=80))**

**Module I**

6. a) Why embedded systems are termed as real time systems? Explain the concept with the help of examples. (10)  
b) Describe the embedded system product development life cycle model (10)

**OR**

7. a) Explain the current trends and challenges in the field of embedded systems. (10)  
b) Explain with necessary diagrams the different software life cycle models (10)

**Module II**

8. a) With a neat diagram explain the architecture of 8051. (10)  
b) Write an Assembly Language program to add two 32 bit numbers and save in 60H onwards. (10)

**OR**

9. a) Explain the different addressing modes of 8051 with example. (10)  
b) Write an embedded C program to convert packed BCD to ASCII numbers and vice versa (10)

**Module III**

10. a) Assume that a 1Hz frequency pulse is connected to input pin P3.4. Write an Assembly Language Program to count the number of pulses during 1 sec. XTAL=22 MHz . (10)  
b) Write an 8051 C program to transfer serially the message "GOODBYE" continuously at 57,600 baud rate. (10)

**OR**

11. a) Switch is connected to P1.2. Write a program to monitor the switch and create the following frequencies on pin P1.7 SW= 0; 500Hz SW=1; 750 Hz Timer 0 in mode 1. (10)  
b) Explain how serial port programming is done in 8051. What are the ways of doubling the baud rate? (10)

#### **Module IV**

- 12.a) With a neat block diagram, explain an application of embedded system (10)  
b) Discuss how an 8051 can be interfaced to an LCD. Write an embedded C program to send the letters 'I', 'E' and 'S' to the LCD continuously with a delay of 1 second. (10)

**OR**

- 13.a) With a neat connection diagram explain how DAC can be interfaced with 8051 and write a program to output a 5 step staircase waveform. (10)  
b) Explain how Interrupt programming is done in the case of 8051 programming. (10)