

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-VII Examination-Nov/Dec.-2011

Subject code: 170907

Date: 29/11/2011

Subject Name: Advanced Microcontrollers & Embedded System

Time: 10.30 am-01.00 pm

Total marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Sketch and explain the block schematic of NXP Microcontroller P89C51RD2xx. **07**
- (b) State and explain in short the advanced features of Si-Lab. Microcontroller C8051F12x. **07**

- Q.2** (a) Write notes on: **07**
- (i) Real Time Operating System.
- (ii) Task and Semaphores.
- (b) Enumerate the operating modes of PCA Timer modules of si-Lab. C8051F12x microcontroller and explain any one of them in detail using appropriate diagram with SFR involved. **07**

OR

- (b) Write down the procedural steps required to measure the Pulse Width of a waveform using PCA Timer module. Also write the set of instructions for the same either for NXP or Si-Lab. microcontroller you have studied. **07**

- Q.3** (a) Give significance of SPI Protocol and explain its Master Mode operation in detail using connection diagram for NXP or Si-Lab. Microcontroller. **07**
- (b) Discuss the SMBus protocol giving its typical configuration and explain any one transfer modes using sequence diagram. **07**

OR

- Q.3** (a) Explain in short the operational modes of UART1 of Si-lab. Microcontroller. **07**
- (b) Describe the bits of SCON register of P89C51RD2xx microcontroller. **07**

- Q.4** (a) Why Watch-dog timer is necessary for embedded systems? Describe the formula for Time-out period of NXP and Si-Lab. microcontrollers. **07**
- (b) Write the instruction sequence to generate a 2-KHz square wave using Timer 2 of C8051F12x which runs with the internal 24.5 MHz SYSCLK. Assume System Initialization routine is readily available. **07**

OR

- Q.4** (a) Write an assembly or C-program to measure frequency of an unknown signal using two timers of P89C51RD2xx microcontroller. Assume Oscillator frequency as 12MHz. **07**
- (b) Describe in short the various modes in which the Timer 2 of P89C51RD2xx microcontroller can be used for different applications. **07**

- Q.5 (a)** Explain with diagram, the various sources of system clock used in Si-Lab. C8051F12x microcontroller. What is the role of PLL in the generation of system clock? **07**
- (b)** What are the uses of “Priority Crossbar Decoder” in Si-Lab. microcontroller C8051F12x. Also write an instruction sequence to assign peripherals UART0, SPI0(Three wire mode), SMBus, CEX0...CEX5, CP0, CP1, /INT0, /INT1, T2, T2EX, /SYSCLK to use I/O Pins and disallow other peripherals to use I/O Pins. **07**

OR

- Q.5 (a)** What are different ways through which the Start Of Conversion is initiated in ADCs and procedure to detect End Of Conversion for Si-Lab. microcontroller. **07**
- (b)** What is SFR Paging ? Explain the operation of three byte SFR Page stack in the event of Interrupt handling. **07**
