

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII • EXAMINATION – WINTER • 2014****Subject Code: 170907****Date: 29-11-2014****Subject Name: Advanced Microcontrollers and Embedded Systems****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) Draw the block diagram and explain the memory organization of CIP51 in detail. **07**  
 (b) Discuss the capture mode of PCA timer in P89V51RD2 Microcontroller. **07**
- Q.2** (a) Explain voltage reference of C8051F12x with block diagram and describe REF0CN register in detail. **07**  
 (b) What is crossbar? Write instruction sequence to allocate port pins for UART0, the SMBus, UART1, /INT0 and /INT1, P1.2, P1.3, P1.4 for Analog input mode and External memory interface to operate multiplexed mode. **07**
- OR**
- (b) Why the Watchdog timer is necessary? Explain watchdog timer of P89V51RD2. What are the steps in programming to disable the watchdog in Si-Lab? **07**
- Q.3** (a) Write different modes of UART0 and explain in detail mode 1 of 8-bit UART, variable baud rate of C8051F12x. **07**  
 (b) Give significance of SPI protocol and explain its Master Mode operation in detail using connection diagram for NXP Microcontroller. **07**
- OR**
- Q.3** (a) Which are the different UART operational modes in P89V51RD2 Microcontroller? Explain multiprocessor communication. **07**  
 (b) Explain the following modes of SMBus0 of CIP51 (i) Master Transmitter (ii) Master Receiver (iii) Slave Transmitter (iv) Slave Receiver. **07**
- Q.4** (a) Explain the TMOD, TCON and CKCON SFR register for Timer1 of C8051F12x. **07**  
 (b) Write 'c' programme using PCA of P89V51RD2 to measure the duty cycle of given square wave input. Crystal frequency is 12MHz. **07**
- OR**
- Q.4** (a) Discuss the interfacing of 89C51 microcontroller to RTC. **07**  
 (b) Explain the PCA with basic block diagram and describe the PCA control register PCA0N and PCA0 mode register PCA0MD in detail. **07**
- Q.5** (a) Draw and explain interfacing of DAC with 8051. **07**  
 (b) Explain Task states and Task data in RTOS with necessary diagram. **07**
- OR**
- Q.5** (a) Explain the different ways of start of conversion and steps to detect End of conversion for ADC2 of CIP51 microcontroller. **07**  
 (b) Write 'c' programme using PCA of P89V51RD2 for variable duty cycle from minimum to maximum with fixed frequency. Use timer0 in mode 1 to provide appropriate delay. Crystal frequency is 12MHz. **07**

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