

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B.E SEM-V Examination-Nov/Dec.-2011**

**Subject code: 151001****Date: 22/11/2011****Subject Name: Microcontroller and Interfacing****Time: 02.30 am-05.00 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) Explain connection between an 8031 and an external memory consisting of 16K EPROM and an 8K of static RAM with external memory timing diagram. **07**
- (b) Explain two types of activation for external hardware interrupts in detail and also discuss the significance of Gate bit in TMOD register. **07**

- Q.2** (a) Explain control circuitry between the output latch and port 0, port 1, port 3 and port 4. **07**
- (b) Explain Serial data transmission modes in detail. **07**

**OR**

- (b) (i) Explain indirect addressing, external data moves and code memory read only data moves with instructions. **07**
- (ii) Explain Relative range, short absolute range and long absolute range with necessary instructions.

- Q.3** (a) Write a C program using interrupts to do the following: **07**
- (i) Generate a 1000 Hz frequency on P2.1 using T0 8 bit auto reload,
- (ii) Use timer 1 as an event counter to count up a 1-Hz pulse and display it on P0. The pulse is connected to EX1.
- Assume that XTAL=11.0592 MHz. Set the baud rate at 9600.
- (b) Write an assembly language program to generate a square wave with an ON time of 4 ms and an OFF time of 10 ms on all pins of port 0. Assume an XTAL of 22 MHz. **07**

**OR**

- Q.3** (a) Assume that a switch is connected to pin P2.0. **07**
- Write an assembly language program to monitor the switch and perform the following:
- (i) If SW=0 send the message "GOOD" to the serial #0 port.
- (ii) If SW=1 send the message "MORNING" to the serial #1 port.
- (b) Write an 8051 C program to toggle all bits of P2 continuously every 500 ms. Use Timer 1, Mode 1 to create the delay. **07**

- Q.4** (a) Explain how two 16 bit counters T0 and T1 are programmed to count internal clock pulse as a timer and are programmed to count external pulses as a counter. **07**
- (b) Assuming that ROM space starting at 350h contains "BEST LUCK", Write a program to transfer the bytes into RAM location at 50h. **07**

**OR**

- Q.4 (a)** (i) Explain timer flag interrupt, serial port interrupt and external interrupts with example. **07**  
(ii) Explain byte level and bit level logical operation with example.
- Q.4 (b)** Write an 8051 C program to calculate the checksum byte for given data.4 **07**  
bytes of hexadecimal data: 25h, 62h, 3Fh, and 52h.
- Q.5 (a)** Explain interfacing of 8051 with ADC0804 chip. **07**  
**(b)** Describe RTC interfacing with micro controller. Write program to get **07**  
values of hour, minute and second from RTC to RAM location 50h, 51h  
and 52h respectively.
- OR**
- Q.5 (a)** Explain keyboard interfacing with 8051 and also draw flow chart for **07**  
Detection and identification of key activation.
- (b)** Describe interfacing of 8051 with DC motor and PWM. **07**
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