

**GUJARAT TECHNOLOGICAL UNIVERSITY****B. E. - SEMESTER – VII • EXAMINATION – WINTER 2012****Subject code: 172001****Date: 26/12/2012****Subject Name: Microcontrollers and Embedded Systems****Time: 10.30 am – 01.00 pm****Total Marks: 70****Instructions:**

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

- Q.1** (a) Draw and explain memory organization in PIC18F452. **07**  
(b) Explain bit configuration of SFRs INTCON, INTCON2 and INTCON3 in PIC controller. **07**
- Q.2** (a) Explain the working of stepper motor. Also explain 4-step and 8-step sequence. **07**  
What is step angle?  
(b) Interface temperature sensor LM35 with 8051. **07**
- OR**
- (b) Interface any multi-channel ADC with 8051. **07**
- Q.3** (a) Write a C program using interrupts to continuously get data from P2.4 and send it to P2.5 while simultaneously creating 5kHz wave on P2.7 and transmitting letter 'Y' at 4800baud. XTAL= 11.0592MHz. **07**  
(b) Write 8051 C programs for following: **07**  
(i) Convert FFh into its decimal value and display digits on P0, P1 & P2  
(ii) Convert ASCII digits of '3' and '7' to packed BCD and display them on P1.
- OR**
- Q.3** (a) Write a C program to toggle all bits of Port P1 continuously every 500ms. Use timer1 in mode1. XTAL= 11.0592MHz. **07**  
(b) A switch is connected to P2.7. Write a C program to transmit data 'ACK' if SW=0; and 'NACK' if SW=1 at 9600baud. XTAL= 11.0592MHz. **07**
- Q.4** (a) Explain PIC18f stack and stack pointer. Explain with example use of PUSH and POP instructions. **07**  
(b) Explain bit configuration of TMOD and TCON registers. **07**
- OR**
- Q.4** (a) Explain functions of PORTA and PORTB of PIC18f452. **07**  
(b) Draw and explain the connection of 8051 to RS232. **07**
- Q.5** (a) Write a program to find average of marks of 8 students stored at memory locations starting from 30H in data memory of PIC controller. **07**  
(b) Write instructions to set up INT1 as high priority interrupt and set up a counter to count till 15 and reset the counter again. Increment count on falling edge in PIC18F452. **07**
- OR**
- Q.5** (a) Write a program to convert an 8-bit number stored in WREG into its ASCII. Send one ASCII value to PORTB and another to PORTC. **07**  
(b) Write a program to copy an array from program memory to data memory of PIC18F452. **07**

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