

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– VII• EXAMINATION–SUMMER 2015****Subject Code: 173203****Date:08/05/2015****Subject Name: Microprocessor and Microcontroller****Time:2.30pm-5.00pm****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) Discuss 8085 Bus organization and Programming model **07**  
 (b) Explain generation of control signals  $\overline{IOR}$ ,  $\overline{IOW}$ ,  $\overline{MEMW}$ ,  $\overline{MEMR}$  **07**
- Q.2** (a) Explain Flag register PSW of 8085 Microprocessor **07**  
 (b) Explain difference between 8085 microprocessor and 8051 microcontroller **07**
- OR**
- (b) Explain circuit diagram to de-multiplex AD0-AD7 bus of 8085 microprocessor to separate out data bus and low order address bus **07**
- Q.3** (a) Explain interfacing of 8 LEDs with port P1 in common anode form. Write assembly or C language program to glow LEDs one by one continuously at the interval of 1 second. Use software delay considering crystal frequency 6 MHz **07**  
 (b) Draw interfacing diagram to interface 16x2 LCD with 8051 microcontroller. Use port P0 to drive data lines and pins from port P1 for control signals. Write program to display message “Microcontroller ” on the LCD screen **07**
- OR**
- Q.3** (a) Explain following instructions of 51 family microcontroller **07**  
 [1] MOV A,0AAh [2] MOV A,#0AAh [3] MOV @R1,#44h  
 [4] MOVC A,@A+DPTR [5] XCH A,R2 [6] XCHD A,R2 [7] CPL A  
 (b) Explain programming of timer in auto-reload mode. What is the application of auto-reload mode? **07**
- Q.4** (a) Explain interfacing of 4x4 matrix keyboard with microcontroller. Write program to read key-press event and display key-code on LEDs connected at port P0 **07**  
 (b) Write C or assembly language program to generate square wave of 100 Hz at port pin P1.0 using timer interrupt. **07**
- OR**
- Q.4** (a) Draw interfacing diagram to interface relay with 8051 microcontroller. Relay circuit is to be controlled with pin P2.0. Interface one push-button switch at P1.0. Write program to energize relay when push-button switch is pressed once and it should de-energize when push-button switch is pressed second time (Push to ON and push to OFF action). **07**  
 (b) Explain pin configuration of 8051 and explain functions of EA, T0 and PSEN pins. **07**
- Q.5** (a) Draw interfacing diagram to interface stepper motor with 8051 microcontroller. Write program to rotate motor in half step mode and full step mode. Write routine to increase or decrease speed of the motor when switch connected to external interrupt 0 and 1 pressed respectively. **07**  
 (b) Explain programming model of 51 family microcontroller **07**
- OR**
- Q.5** (a) Explain programming steps for serial communication. Write program in C language to transmit message “Microcontroller and Microprocessor” to PC at **07**

baud rate 19200 continuously.

- (b) Draw interfacing diagram to interface DC motor with 8051 microcontroller with help of IC L293D. Write a program to rotate motor in clockwise direction. Direction of motor should change to anticlockwise when external interrupt 0 is generated by pushbutton switch.

**07**

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