Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**PDDC - SEMESTER–VI • EXAMINATION – WINTER • 2014**

**Subject Code: X 60902** **Date: 02-12-2014**

**Subject Name: Microcontroller and Interfacing**

**Time: 02:30 pm - 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) Draw and explain block diagram of 8051 microcontroller in brief (8)

(b) Explain the criteria for choosing a microcontroller. Give the list of applications in which microcontroller is generally used (6)

Q.2 (a) Discuss the types of flags that are available in PSW and PCON register. Explain how they are set and reset. (7)

(b) Draw and explain P0 and P1 port structure of 8051 (7)

OR

(b) What is the size of internal ROM and RAM in 8051? Explain RAM memory space allocation in 8051. (7)

Q.3 (a) Discuss the different types of bit manipulation instructions available with 8051 (7)

(b) Explain MUL and DIV instructions of 8051. How overflow flag gets affected during the execution of these instructions? (7)

OR

Q.3 (a) Write an ALP to copy the data from internal RAM locations 12H to 19H, to internal RAM locations 20H to 27H (7)

(b) Write an ALP to check the lower nibble of any number placed in register A. If it is larger than upper nibble, set the carry flag to 1, otherwise clear it (7)

Q.4 (a) Give the format of IE and IP special function registers. Explain the meaning of each bit (7)

(b) What is serial data transmission? Explain the function of SCON and SMOD registers (7)

OR

Q.4 (a) Write an 8051 C program to toggle bit 0 of port P1 500 times (7)

(b) Write a C language code for blinking LED's connected to port 2. Give any suitable delay of your choice (7)

Q.5 (a) What is key bounce? Explain key debounce technique using hardware and software (7)

(b) Explain different modes of timer operation in 8051 (7)

OR

Q.5 (a) With the help of suitable diagram explain how stepper motor can be interfaced with microcontroller (7)

(b) Discuss the interfacing of matrix keyboard with 8051. With the help of flowchart explain how key closure can be detected (7)