

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER- VI (Old) EXAMINATION – WINTER 2019****Subject Code: 160903****Date: 04/12/2019****Subject Name: Microcontroller****Time: 02:30 PM TO 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) With the help of neat sketch explain the functional block diagram of 8051 **07**  
(b) Draw and explain structure of P0 and P1 ports in 8051 microcontroller **07**
- Q.2** (a) Write a short note on internal memory structure of 8051. **07**  
(b) Explain all the bits of PSW register & hence find the control word for selecting register bank 2. **07**
- OR**
- (b) Explain the instructions 1.PUSH 2.POP 3.DJNE 4.LCALL **07**
- Q.3** (a) Write a program to find the average of ten 8 bit numbers stored at memory location 25H onwards. Store the result at 50H. **07**  
(b) Discuss the different types addressing modes available in 8051 with suitable illustrations **07**
- OR**
- Q.3** (a) Write an ALP to find 2's compliment of a number **07**  
(b) Explain the following instruction **07**  
1. ACALL 2. DJNZ 3. RETI 4.SWAP
- Q.4** (a) Explain TCON and TMOD special function registers. Also discuss how external interrupts can be made edge triggered by setting appropriate bits in TCON **07**  
(b) Write an 8051 C program to transfer the message "WELCOME" serially at 9600 baud 8 bit data, 1 stop bit. Do this continuously **07**
- OR**
- Q.4** (a) How serial data transmission can be done using SCON and SBUF register? Which options are available to increase data transfer rate in 8051? **07**  
(b) Write a C program to toggle all the bits of port0 continuously with 75ms time delay. **07**
- Q.5** (a) Explain LCD interfacing with 8051 microcontroller **07**  
(b) Write a short note on data types available in embedded C. **07**
- OR**
- Q.5** (a) Draw and explain in brief the interfacing circuit of unipolar stepper motor with 8051 **07**  
(b) Explain how the speed and direction of DC motor can be controlled using microcontroller **07**

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