Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–V (NEW) EXAMINATION – SUMMER 2019**

**Subject Code: 2151707** **Date: 06/06/2019**

**Subject Name:Microcontroller & Interfacing (IC)**

**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.**
4. **ALP means Assembly Language Program**

| | | | MARKS |
|---|---|---|---|
| **Q.1** | **(a)** | Briefly write the differences between MOV & MVI instruction in 8085 operation. | **03** |
| | **(b)** | Explain with neat sketch the role of ALE pin of 8085. | **04** |
| | **(c)** | Explain with diagram how 4 bit register store data using RD, WR and enable signal. | **07** |
| **Q.2** | **(a)** | Describe Memory addressing modes of 8051 microcontroller | **03** |
| | **(b)** | What is Special Function Registers? Describe the working of PWS with bit addressable mode. | **04** |
| | **(c)** | Prepare ALP (Assembly Language Program) to ADD 8 consecutive following RAM addresses and store the results in appropriate registers.70= 11H, 71= FEH, 72= BBH, 73= 44H,74=55H, 75=66H,76=FA,77=BFH. Use only iteration (loop) method. | **07** |
| | | **OR** | |
| | **(c)** | Prepare ALP to add (1F1C) and (BBC3) two 16-bit numbers. Place the sum in R7 and R6; R6 should have the lower byte. | **07** |
| **Q.3** | **(a)** | Add two signed numbers (-49D) to (-72D) and store the result in register R7. State bit condition of PSW register before and after this addition | **03** |
| | **(b)** | Write an 8051 C program to Blink LED 90 times. LED should be connected to Port 1 pin no.2. | **04** |
| | **(c)** | Prepare ALP to read the weight of the object and sort out it for the value 0f 77. According to sorting results, place the object whose value into specific registers indicated by the following.<br>If W = 77 then A = 77<br>If H <77 then R1 = W<br>If H >77 then R2 = W | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Discuss the importance of the need of DATA POINTER in 8051 microcontroller application.. | **03** |
| | **(b)** | Prepare ALP to find no. of 1 in given byte= BA and store no. of 1 in R4. | **04** |
| | **(c)** | Make appropriate control word in TMOD register so Timer1 will work as counter 1 in mode 2. Prepare ALP to count the pulses and display the status of the TL1 count on P1, which connects to single 7-segment displays. | **07** |
| **Q.4** | **(a)** | Explain execution of PUSH and POP Instruction. | **03** |
| | **(b)** | Explain the function of each bits of TMOD and TCON Timer | **04** |

registers.


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| | (c) | Prepare Assembly language program (ALP) to generate 1 sec time delay. Use crystal frequency=11.0592MHz | 07 |

**OR**

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| **Q.4** | **(a)** | Discuss in brief the operation of ACALL, LCALL instruction of 8051 microcontroller. | **03** |
| | **(b)** | Describe the function of Pin no. 29, 30 and 31 of DIP 8051 Microcontroller. | **04** |
| | **(c)** | Prepare ALP to send the message "WELCOME TO THE COLLEGE" to serial port. Assume a SW is connected to pin P1.2. Monitor its status and set the baud rate as follows:<br>SW = 0, 4800 baud rate<br>SW = 1, 9600 baud rate<br>Assume XTAL = 11.0592 MHz, 8-bit data, and 1 stop bit. | **07** |
| **Q.5** | **(a)** | Draw and describe interfacing of mircocontroller to 4Kx8 bit memory chip using 74LS138. | **03** |
| | **(b)** | Explain with neat sketch the timing diagram of LCD interfacing with 8051. | **04** |
| | **(c)** | Give brief explaination of ADC signal conditioning and interfacing of LM35 sensor with 8051 microcontroller. | **07** |

**OR**

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| **Q.5** | **(a)** | Write down excitation sequences of stepper motor to run it in clockwise and counter clockwise direction | **03** |
| | **(b)** | Prepare ALP to generate PWM signal using timer mode-2 for speed control of DC motor. | **04** |
| | **(c)** | Write a C program that continuously gets a single bit of data from P1.5 and sends it to P1.2, while simultaneously creating a square wave of 50 µs period on pin P2.5. Use Timer 1 to create the square wave. Assume that XTAL = 11.0592 MHz. | **07** |

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