

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2023

Subject Code:3141008**Date:17-07-2023****Subject Name:Microprocessor & Microcontroller****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Write the conditions when Parity flag, Zero flag and Sign flag will be set and reset in 8085. **03**
 (b) What is the size of stack pointer and program counter in 8085? Explain their functions also. **04**
 (c) Explain the function of following pins of 8085. **07**
 1. TRAP 2. SOD 3. HLDA 4. READY
- Q.2** (a) Explain (1) LDS (2) STS instruction with the help of an example. **03**
 (b) Draw and explain Data memory space of AVR with no extended I/O memory. **04**
 (c) List down criteria for choosing a microcontroller to use it in any electronics circuits and system. **07**
- OR**
- (c) Assume that R20 has packed BCD. Write a program to convert the packed BCD to two ASCII numbers and place them in R21 and R22. **07**
- Q.3** (a) Write down the conditions when Negative flag and Overflow flag will be set and reset in AVR. **03**
 (b) Explain the function of DDRx, PORTx and PINx registers in AVR. **04**
 (c) Write a program to find number of 1s in a given byte. **07**
- OR**
- Q.3** (a) What is branch penalty and its role in AVR? **03**
 (b) Specify the reasons for writing program in C language instead of assembly language. **04**
 (c) List down logical instructions used in AVR and explain any 4 of them with an example. **07**
- Q.4** (a) List down sources of interrupts in the AVR. **03**
 (b) Explain function of each bit of TCCR0 (Timer/Counter Control Register). **04**
 (c) Explain following instructions with an example. **07**
 1.SWAP 2.ASR 3.ROL 4.LSR
- OR**
- Q.4** (a) Discuss the function of X, Y and Z register in AVR? **03**
 (b) Write a AVR C program to toggle only bit 4 of PORT C continuously without disturbing the rest of pins of PORT B. **04**
 (c) Write down steps to program Timer 2 in normal mode. **07**
- Q.5** (a) Find the value for TCCR1A and TCCR1B to program Timer 1 as Normal mode and the OC1A generator as square wave generator and no prescaler. **03**
 (b) List down the registers associated with USART and explain the role of each register in brief. **04**
 (c) Write down steps to program A/D Converter using polling. **07**
- OR**
- Q.5** (a) Explain with neat diagram, stepper motor interfacing with AVR **03**
 (b) Give the name and functions of register used for SPI Protocol. **04**
 (c) List down features of I2C protocol and explain any two in details. **07**
