

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER- IV EXAMINATION – SUMMER 2020****Subject Code: 3141008****Date: 02/11/2020****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.

- Q.1** (a) List the applications in which microcontrollers are used. **03**
(b) Explain the functions of following pins of 8085. **04**
1.ALE 2.TRAP 3.RESET OUT 4.READY
(c) Discuss the flag register of 8085. **07**
- Q.2** (a) Differentiate between Microprocessor and Microcontroller. **03**
(b) What is the use of stack and stack pointer in ATmega32? How many locations of stack are used when CALL and RCALL instructions are executed? **04**
(c) List the features of RISC Architecture. **07**
- OR**
- (c) Explain ATmega32 Data memory in detail. **07**
- Q.3** (a) Write a program to get status of PB3 pin and put it on PB0 pin. **03**
(b) Write a program to generate square wave with 80% duty cycle on bit PC7. **04**
(c) Explain following instructions: **07**
1.SWAP 2.ASR 3.NEG 4.EOR 5.TST 6.SBR 7.BRCC
- OR**
- Q.3** (a) Write a program to find no of 1s in given byte. **03**
(b) How many fuse bits are available in ATmega32? How are they used? **04**
(c) Explain addressing modes of ATmega32 with the example. **07**
- Q.4** (a) List some of the interrupt sources in ATmega32. **03**
(b) What is the difference between RET and RETI instructions? Explain why we cannot use RET instead of RETI as the last instruction of interrupt service routine (ISR). **04**
(c) Assuming clock pulses are fed into pin T1 (PB1) of ATmega32. Write a program for counter 1 in normal mode to count the pulses on falling edge and display the status of TCNT1 count on PORT C and PORT D. **07**
- OR**
- Q.4** (a) Write down the steps to program Timer 0 in Normal Mode. **03**
(b) Write a program for ATmega32 to transfer letter 'Z' serially at 9600 baud rate continuously. Assume XTAL=8 MHz. **04**
(c) Write a program in C to generate a square wave of 16 KHz on pin PORTB.3. USE XTAL= 8 MHz. Use timer 0 in CTC Mode. **07**
- Q.5** (a) What is the use of input capturing? Which timers of ATmega32 can be used for input capturing? **03**
(b) Write the steps for reading data from SPI Device in single byte mode. **04**
(c) Explain the connection of stepper motor with ATmega32. Write a program to rotate it continuously. **07**
- OR**
- Q.5** (a) What is clock stretching with reference to I2C protocol? **03**
(b) Draw the necessary circuit for 8 bit data transfer between ATmega32 and LCD. Use PORT A of ATmega32 for 8 bit data. **04**
(c) State the features of ADC of ATmega32 and discuss steps of ADC programming. **07**