

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER- V EXAMINATION-SUMMER 2023****Subject Code: 3152409****Date: 03/07/2023****Subject Name: Microcontrollers Architecture, Interfacing and Applications****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. Simple and non-programmable scientific calculators are allowed.

MARKS

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|------------|---|-----------|
| Q.1 | (a) Define ALU and state its importance. | 03 |
| | (b) Draw schematic diagram of 4x1 Mux and describe it's working. | 04 |
| | (c) Explain any three arithmetic instructions with example. | 07 |
| Q.2 | (a) Draw pin description of 8051 uC. | 03 |
| | (b) Write a short note on BCD. | 04 |
| | (c) Write a C program to generate PWM with 75 % duty cycle with any random time period. | 07 |
| OR | | |
| | (c) State various assembler directives and explain any two directives. | 07 |
| Q.3 | (a) Describe PSW register. | 03 |
| | (b) Draw internal block diagram of 8051. | 04 |
| | (c) State the difference between ACALL & LCALL instructions. Describe the effect of these instructions on stack and stack pointer. | 07 |
| OR | | |
| Q.3 | (a) State 8051 pins used while interfacing with external program memory. | 03 |
| | (b) Define bits of SCON & TCON registers. | 04 |
| | (c) List and explain I/O ports of 8051 and their functions. | 07 |
| Q.4 | (a) Discuss tri-state logic. | 03 |
| | (b) Define (1) Latency time (2) Response time. | 04 |
| | (c) Write a note on serial communication. | 07 |
| OR | | |
| Q.4 | (a) Define software delay. | 03 |
| | (b) Describe interrupts and list 8051 interrupts. | 04 |
| | (c) Write a note on programming of timers in 8051. | 07 |
| Q.5 | (a) Describe LED interfacing with 8051. | 03 |
| | (b) Draw schematic and explain stepper motor interfacing with 8051. | 04 |
| | (c) Describe 4x3 matrix key board interfacing with 8051. | 07 |
| OR | | |
| Q.5 | (a) Define subroutine and its importance in programming. | 03 |
| | (b) Draw schematic showing interfacing of 8051 with ADC 0804. | 04 |
| | (c) Explain a scheme to display 0-9 on a seven-segment display connected to Port 1 of 8051. | 07 |
