

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 5 – EXAMINATION – SUMMER 2026

Subject Code: 3152409

Date: 06/06/2026

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.**

- Q.1**
- (a) Give any three comparisons for microprocessors and microcontrollers. **03**
 - (b) Describe 4X1 multiplexer with necessary diagrams & tables. **04**
 - (c) Describe detailed block diagram of 8051 microcontroller. **07**
- Q.2**
- (a) Draw pin diagram of 8051 microcontroller. **03**
 - (b) Explain bits of PSW register. **04**
 - (c) Explain addressing modes of 8051 using data transfer instruction. **07**
- OR
- Q.2**
- (c) Explain the port structure of 8051 microcontroller. **07**
- Q.3**
- (a) Explain multiplication instruction of 8051 microcontroller. **03**
 - (b) Give example of bit addressable instruction with example. **04**
 - (c) Describe any three branching instructions with example. **07**
- OR
- Q.3**
- (a) Explain division instruction of 8051 microcontroller. **03**
 - (b) Differentiate absolute and relative jump instructions in 8051 microcontroller. **04**
 - (c) Explain any two logical instructions with examples. **07**
- Q.4**
- (a) State what is interrupt in microcontroller ? List various interrupts of 8051 microcontrollers. **03**
 - (b) Write assembly language code for generation of gate pulse with 75% duty cycle on port pin P1.0. **04**
 - (c) Explain 8051 timer in mode 1 with necessary SFR configurations. **07**
- OR
- Q.4**
- (a) What is instruction cycle in micro controller? **03**
 - (b) Write C language code for generation of gate pulse with 75% duty cycle on port pin P1.0. **04**
 - (c) Explain 8051 timer in mode 2 with necessary SFR configurations. **07**
- Q.5**
- (a) What is stack area in microcontroller. Explain its utility in brief. **03**
 - (b) Describe interfacing of 7-segment LED display with 8051 microcontroller. **04**
 - (c) Describe interfacing of LCD display with 8051 microcontroller. **07**

OR

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| Q.5 | (a) Describe bits of IP register of 8051 microcontroller. | 03 |
| | (b) Write a note on serial data transfer with 8051 uC. | 04 |
| | (c) Explain 4 x 4 key board interface with 8051 micro controller. | 07 |
