

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2020**

**Subject Code: 2172001**
**Date: 19/01/2021**
**Subject Name: Microcontrollers and Embedded Systems**
**Time: 10:30 AM TO 12:30 PM**
**Total Marks: 56**
**Instructions:**

1. Attempt any **FOUR** questions out of **EIGHT** questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
<b>Q.1</b>	(a) Draw block diagram of a generalized embedded system.	<b>03</b>
	(b) Describe the challenges faced in Embedded system design.	<b>04</b>
	(c) Write a note on serial interface protocols (i) I <sup>2</sup> C (ii) SPI	<b>07</b>
<b>Q.2</b>	(a) How can one access code ROM space in 8051?	<b>03</b>
	(b) Define checksum byte. Why is checksum operation performed & how?	<b>04</b>
	(c) Draw & explain RS-232 connections to Atmel 8051.	<b>07</b>
<b>Q.3</b>	(a) Explain the bits of TCON SFR that are related to interrupts.	<b>03</b>
	(b) Draw a neat interfacing diagram of ADC0848 with Atmel 8051.	<b>04</b>
	(c) An external pulse train is connected to pin T0. WAP in C to display the count on ports P1 & P2.	<b>07</b>
<b>Q.4</b>	(a) Enlist the types of interrupts in 8051 with priority & vector address.	<b>03</b>
	(b) WAP in C to convert BCD to decimal & display the value on ports P1, P2 & P3.	<b>04</b>
	(c) WAP in C to rotate stepper motor in an 8-step sequence.	<b>07</b>
<b>Q.5</b>	(a) Explain the instructions related to subroutines in PIC18F4xx.	<b>03</b>
	(b) Explain PORTA functions of PIC18F4xx.	<b>04</b>
	(c) Interface 7-segment display with PIC18F4xx.	<b>07</b>
<b>Q.6</b>	(a) Differentiate between SFR, FSR & BSR.	<b>03</b>
	(b) Enlist & explain the addressing modes of PIC18F4xx with examples.	<b>04</b>
	(c) How can data be transferred from program memory to data memory in PIC18F4xx? Illustrate with an example.	<b>07</b>
<b>Q.7</b>	(a) Explain bit configuration of T0CON SFR of PIC18F4xx.	<b>03</b>
	(b) State the machine control instructions.	<b>04</b>
	(c) Write an ALP to generate a square wave of 10kHz on RC0 port pin, given clock frequency of 40MHz.	<b>07</b>
<b>Q.8</b>	(a) State the name & function of SFRs related to I/O ports in PIC18F4xx.	<b>03</b>
	(b) Explain the bit pattern of IPR1 & PIE1 SFRs of PIC18F4xx.	<b>04</b>
	(c) An array of 10 data is stored at addresses beginning from 0x100 in PIC18F4xx. Write an ALP to square those numbers & store them at addresses beginning from 0x120.	<b>07</b>

\*\*\*\*\*