

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2018****Subject Code:2150306****Date:20/11/2018****Subject Name:Microcontroller & Interfacing (Biomedical)****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.

		MARKS
Q.1	(a) What is the difference between a microcontroller and microprocessor?	03
	(b) Draw inside the 8051 Microcontroller block diagram and explain a brief history of the 8051.	04
	(c) Draw and explain architecture of 8051 microcontroller.	07
Q.2	(a) Explain DB, EQU and END directives.	03
	(b) How do you assemble and run an 8051 program?	04
	(c) Write a program for AT89C51 to toggle all the bits of P0 and P1 every ¼ of a second. Assume a crystal frequency of 11.0592 MHz	07
OR		
	(c) Draw and explain Pin description of the 8051 microcontroller.	07
Q.3	(a) How to switch register banks? Write necessary codes.	03
	(b) Assume that XTAL = 20MHz. Find the TH1, TL1 value to generate a time delay of 1 ms. Timer1 is programmed in mode 1.	04
	(c) Explain logic and compare instructions with examples in assembly language programming.	07
OR		
Q.3	(a) Explain PUSH and POP instruction with example.	03
	(b) Explain the dual role of Port 2.	04
	(c) Explain timer mode 1 programming with its steps and logic diagram.	07
Q.4	(a) Write 8051 interrupt priority upon reset. How do you set it with IP register?	03
	(b) Explain SCON special function register in detail.	04
	(c) Write an 8051 C program to send letters 'W', 'R' and 'K' to the LCD using delays.	07
OR		
Q.4	(a) Write a program to receive the data which has been sent in serial form and send it out to port 1 in parallel form. Also save the data at RAM location 50H.	03
	(b) Explain TCON special function register in detail.	04
	(c) Draw 8051 connection to ADC0809 for channel 1. Write necessary assemble language code for it.	07
Q.5	(a) Define Interrupt Service Routine (ISR) and Interrupt Vector Table for the 8051.	03
	(b) Write a note on electromechanical relays.	04
	(c) Draw and explain 8051 connection to external data ROM. Explain MOVX instruction.	07

OR

- Q.5** (a) Explain the importance of RI and TI flags. **03**
- (b) Explain various addressing modes of 8051 microcontroller. **04**
- (c) Explain the connection diagram for controlling Stepper Motor via Optoisolator. Write an assembly code if a switch SW is connected to pin P2.7 then monitor its status and perform the following: **07**
- (1) If SW=1, the stepper motor moves clockwise.
 - (2) If SW=0, the stepper motor moves counterclockwise.
