Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-VI Examination-Nov/Dec-2011

Subject code: 160903 **Date: 25/11/2011**

Subject Name: Microcontroller

Time: 10.30 am -1.00 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)**	How Microprocessor differs from Microcontroller?	**07**
	(b)	With a suitable block diagram, explain the architecture of 8051 microcontroller.	**07**
Q.2	**(a)**	Explain following in detail with an appropriate example: (1) Any two Logical instructions. (2) Any two Branching instructions. (3) Any three Bit addressable instructions.	**07**
	(b)	Explain four modes of timer's operation in brief along with appropriate example for 8051 controller.	**07**
		OR	
	(b)	Differentiate between the following instructions of 8051 microcontroller. (i) SWAP and XCHG (ii) MOVX and MOVC (iii) Bit level ANL and byte level ANL	**07**
Q.3	**(a)**	Write an ALP to move a block of 6 data bytes, stored in internal RAM starting at location 30h to locations starting at 33h	**07**
	(b)	Write an ALP to add a block of 5 data bytes, stored in internal RAM starting at location 40h and store the result at location 45h (consider carry).	**07**
		OR	
Q.3	**(a)**	Explain Addressing modes of 8051 microcontroller along with a suitable example.	**07**
	(b)	What is an assembler directive? Give at least five examples of assembler directives and explain function of each in brief.	**07**
Q.4	**(a)**	Write a short note on available data types in embedded C.	**07**
	(b)	List the default interrupt priority. Explain IP and IE registers of 8051 microcontroller.	**07**
		OR	
Q.4	**(a)**	Write an 8051 program in embedded C to blink the LED connected to pin P1.5 at a suitable delay interval.	**07**

(b) Explain every step of the following program and also calculate the frequency of the square wave generated at the end of program execution. (assume crystal frequency = 11.0592MHz) **07**

```
        MOV  TMOD, #20H
        MOV  TH1, #4H
        SETB  TR1
L1:     JNB   TF1, L1
BACK:  CPL   P1.5
        CLR   TF1
        SJMP  BACK
```

Q.5 **(a)** What do you mean by SFR? Draw and discuss the formats and bit definition of the following SFR's in 8051 microcontroller? **07**
(a) PCON (b) PSW (c) TMOD

(b) Differentiate between SPI and I^2C protocols of serial communication. **07**

OR

Q.5 **(a)** Draw the circuit diagram to interface seven segment display with 8051 microcontroller. **07**

(b) Draw and explain interfacing circuit of unipolar stepper motor with 8051 microcontroller using transistor drivers. **07**

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