Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2022

Subject Code:3160914 Date:01/06/2022

Subject Name:Microprocessors and Microcontrollers

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	List various processing modes of ARM processors with classification.	**03**
	(b)	With diagram explain complete ARM register set.	**04**
	(c)	A 10 bytes of data string is stored at starting from memory location 40h. Write an assembly language program for 8051 microcontroller to transfer this data string to memory location starting from 50h in reverse order.	**07**
Q.2	**(a)**	Explain the function of following pins in 8085 µp: HLDA & HOLD	**03**
	(b)	Illustrate how address/data lines AD0-AD7 are de-multiplexed in 8085 µp?	**04**
	(c)	A byte is stored in external memory location 2005H. Write an 8051 µc assembly language program to count number of 0's and 1's in. Draw flowchart.	**07**
		OR	
	(c)	Draw and explain timing diagram of instruction STA 2000H of 8085 µp.	**07**
Q.3	**(a)**	Explain 8051 program status word (PSW) register in brief.	**03**
	(b)	Discuss various addressing modes of 8051 microcontroller assembly language programming.	**04**
	(c)	Write a 8051 assembly language program to generate a square wave of 1.5 kHz frequency at P2.0 using Timer 0 in Mode 1 with crystal frequency of 12 MHz.	**07**
		OR	
Q.3	**(a)**	Explain editor, assembler, compiler and linker	**03**
	(b)	Explain all the bits of TCON register**.**	**04**
	(c)	Explain the Interrupt facility of 8051 microcontroller using IE and IP register. Also mention the internal priority of Interrupt and their vector locations.	**07**
Q.4	**(a)**	Write C program to get bit P1.0 and send it to P2.1 after inverting it.	**03**
	(b)	Explain interfacing of DC motor using H-bridge circuit with 8051 microcontroller.	**04**
	(c)	Write an 8051 program in embedded C to blink the LED connected to pin P1.5 at a suitable delay interval.	**07**
		OR	
Q.4	**(a)**	C programming is more preferred over assembly programming for 8051 µc. Justify your answer with proper reason.	**03**
	(b)	Explain interfacing of 8051 with ADC 0808.	**04**
	(c)	What is an assembler directive? Give at least four examples of assembler directives and explain function of each in brief.	**07**

Q.5 **(a)** Explain basic differences (1) Van neuman and Harvard architecture (2) CISC and RISC. **03**

(b) How baud rate can be set in 8051 microcontroller for serial communication? **04**

(c) Explain and Differentiate between the following instructions of 8051 microcontroller. **07**

(i) SWAP and XCHG (ii) MOVX and MOVC

(iii) Bit level ANL and byte level ANL

OR

Q.5 **(a)** Explain advantages of IDE in program development. **03**

(b) Write a short note on available data types in embedded C. **04**

(c) 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
```

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