Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2021

Subject Code:3151107 Date:01/01/2022

Subject Name:Advance Microcontroller

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.**

			Marks
Q.1	**(a)**	**What is branch penalty in pipelining structure of ARM?**	**03**
	(b)	**List the features of ARM microcontroller which makes it an advanced microcontroller.**	**04**
	(c)	**With neat block diagram, explain types of computer architectures. ARM7 falls in which of that architecture?**	**07**
Q.2	**(a)**	**Name and explain ARM user registers.**	**03**
	(b)	**Explain working of various multiply instructions in ARM with proper example.**	**04**
	(c)	**Write a c program that use TIMER to blink LED at 1 KHZ frequency.**	**07**
		OR	
	(c)	**Write a c program that send and receive data from UART device interfaced with ARM.**	**07**
Q.3	**(a)**	**Discuss in brief development history of ARM7.**	**03**
	(b)	**Draw and explain basic architecture of cache memory.**	**04**
	(c)	**Explain following ARM instructions.** **I) STR R3, R[5] II) ADD R2,R2,#1** **II) EOR R2,R3,#0x75 IV) MOVS R2,R1,LSL #3**	**07**
		OR	
Q.3	**(a)**	**How will you perform bit-wise operation in C using ARM compiler?**	**03**
	(b)	**List and explain AMBA AHB bus features.**	**04**
	(c)	**Explain software interrupt instruction (SWI) in ARM with proper example.**	**07**
Q.4	**(a)**	**Explain CPSR and SPSR register structure in ARM.**	**03**
	(b)	**Write a c program that toggle port1 pin in every 1 second interval.**	**04**
	(c)	**Explain ARM addressing modes with examples.**	**07**
		OR	
Q.4	**(a)**	**What is a Thumb mode in ARM? Explain in brief.**	**03**
	(b)	**Explain ARM processor exceptions and modes.**	**04**
	(c)	**Explain ARM 5-stage pipe-lining concept with diagram.**	**07**

Q.5	**(a)**	**Explain conditional code execution in brief.**	**03**
	(b)	**Explain flush and clean operation performed on a cache memory in ARM.**	**04**
	(c)	**Explain following directives of ARM assembler** **1) EQU 2) AREA 3) INCLUDE 4) RN 5) ALIGN**	**07**

OR

Q.5	**(a)**	**What do you understand by ARM load and store architecture?**	**03**
	(b)	**List and explain main control component in ARM MMU.**	**04**
	(c)	**Write an assembly language program to add a series of ten 16-bit numbers by using a table address.**	**07**