Seat No.: _____  Enrolment No. 

# GUJARAT TECHNOLOGICAL UNIVERSITY

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

**Subject Code:3151107** **Date:27/01/2021**

**Subject Name:Advance Microcontroller**

**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.**

| | | | |
|---|---|---|---|
| **Q.1** | **(a)** | What is CPSR? Draw an approximate format of SPSR register. | **03** |
| | **(b)** | Describe the principle features of the ARM architecture. | **04** |
| | **(c)** | Compare RISC architecture and CISC architecture. | **07** |
| **Q.2** | **(a)** | What is difference between FIQ and IRQ? Why FIQ response is fast than IRQ? | **03** |
| | **(b)** | Explain all registers of ARM7TDMI architecture. | **04** |
| | **(c)** | Explain the following ARM instructions with an example.<br>1.MOVEQ 2.MLA 3.BLX 4.LDR | **07** |
| **Q.3** | **(a)** | Describe the rules defined in ARM-Thumb Procedure Call Standard for calling a function. | **03** |
| | **(b)** | Draw and explain arm multi cycle instruction 3 stage pipeline operation. | **04** |
| | **(c)** | Write a program to find number of 1's in a given number. | **07** |
| **Q.4** | **(a)** | Discuss the thumb programmer's model in brief. | **03** |
| | **(b)** | Explain the following ARM instructions with an example.<br>1.CMP 2.TEQ | **04** |
| | **(c)** | Explain Stack operation in ARM with its types in detail. Also explain instructions used for Stack. | **07** |
| **Q.5** | **(a)** | Explain any three assembler directives used for ARM assembly programming. | **03** |
| | **(b)** | Write C program for HEX to ASCII conversion. | **04** |
| | **(c)** | Write a program for finding largest and smallest numbers of given 10 numbers. | **07** |
| **Q.6** | **(a)** | List the properties of Thumb Instruction Set. | **03** |
| | **(b)** | Explain the importance of cache bit and buffer bit. | **04** |
| | **(c)** | What is the use of paging mechanism? Show how paging is done in any of ARM families of processors. | **07** |
| **Q.7** | **(a)** | Write down the advantages of MMU. | **03** |
| | **(b)** | List down arm development tools and explain uses of them. | **04** |
| | **(c)** | Explain Addressing Modes used for ARM data transfer Operation. Explain the types of Base plus offset addressing used for ARM data transfer operation with examples | **07** |
| **Q.8** | **(a)** | List out the steps required to switch between tasks. | **03** |
| | **(b)** | Explain the function of Translation look aside buffers in virtual memory system. | **04** |
| | **(c)** | Describe AMBA Arbitration with the help of a diagram for AMBA based system. | **07** |