Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) EXAMINATION – SUMMER 2021

Subject Code:2140707 **Date:07/09/2021**

Subject Name:Computer Organization

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 the importance of data transfer instructions and program control instructions?	**03**
	(b)	List any four registers of basic computer with their functionalities.	**04**
	(c)	Write a note on general register organization.	**07**
Q.2	**(a)**	Write any two differences between hardwired control and microprogrammed control.	**03**
	(b)	Draw a block diagram of 4-bit binary incrementer and explain it briefly.	**04**
	(c)	Enlist various addressing modes and explain the same in brief with proper example.	**07**
		OR	
	(c)	A computer uses a memory unit with 512K words of 64 bits each. A binary instruction code is stored in one word of memory. The instruction has four parts: an indirect bit, an operation code, a register code part to specify one of 128 registers and an address part. 1. How many bits are there in the operation code, the register code part and the address part? 2. Draw the instruction word format and indicate the number of bits in each part. 3. How many bits are there in the data and address inputs of the memory?	**07**
Q.3	**(a)**	Discuss pseudoinstruction in brief.	**03**
	(b)	Explain the following instructions: - ISZ - BSA	**04**
	(c)	Write a detailed note on : microprogram sequencer.	**07**
		OR	
Q.3	**(a)**	Explain three-state bus buffer in brief.	**03**
	(b)	Write the differences between register stack and memory stack.	**04**
	(c)	Elaborate first pass of an assembler.	**07**
Q.4	**(a)**	Write a note on subroutine call and return.	**03**
	(b)	Explain RISC in brief.	**04**
	(c)	Discuss arithmetic pipeline in detail with neat diagram.	**07**
		OR	
Q.4	**(a)**	What is meant by resource conflicts in pipelining? Explain in brief with solution.	**03**
	(b)	Write a program to evaluate the following arithmetic statement: X = A + B * (C – D) * (E / F + G) Using a general register computer with two address instructions.	**04**

	(c)	Discuss Booth multiplication algorithm with proper illustration.	**07**
Q.5	**(a)**	Assume A = + 9 and B = + 3, perform A + B using sign-magnitude number representation. Make necessary assumptions if required.	**03**
	(b)	Write a brief note on Flynn's classification.	**04**
	(c)	Enlist different types of mapping procedures in consideration of cache memory organization. Explain any two in detail.	**07**

OR

Q.5	**(a)**	Draw the block diagram of associative memory.	**03**
	(b)	Explain DMA in brief.	**04**
	(c)	Describe cache coherence problem with its solution(s).	**07**

****