Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) EXAMINATION – SUMMER 2024

Subject Code:2140707 Date:01-07-2024

Subject Name:Computer Organization

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)**	Enlist the major components of CPU and explain each in brief.	**03**
	(b)	Write the name of basic computer registers with their functionalities.	**04**
	(c)	Draw and explain flowchart for instruction cycle.	**07**
Q.2	**(a)**	What do you mean by pseudoinstruction? Give any three examples of pseudoinstructions.	**03**
	(b)	Briefly discuss 4-bit binary adder.	**04**
	(c)	A computer uses a memory unit with 256K words of 32 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 64 registers, and an address part. 1. How many bits are there in 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**
		OR	
	(c)	Draw the flowchart for first pass of assembler and explain the same in detail.	**07**
Q.3	**(a)**	Perform A – B (subtract) operation for the following numbers using signed magnitude number format. (Write necessary assumptions if required) A = + 10 and B = - 6	**03**
	(b)	Enlist various addressing modes and explain any two in brief with proper example(s).	**04**
	(c)	Discuss microprogrammed control organization with neat diagram.	**07**
		OR	
Q.3	**(a)**	State the differences between RISC and CISC.	**03**
	(b)	Write microoperations needed to execute the following instructions: - AND - BUN	**04**
	(c)	Write zero address and two address instructions program for the following arithmetic expression. P= (A - B) * (C +D *E) + F / G	**07**
Q.4	**(a)**	Explain Flynn's classification for computers in brief.	**03**
	(b)	In certain scientific computations it is necessary to perform the arithmetic operation $(A_i + B_i) * (C_i + D_i)$ with a stream of numbers. Specify pipeline configuration to carry out this task. List the contents of all registers in the pipeline for i=1 through 3.	**04**

	(c)	Assume A = + 5 and B = + 8, apply Booth algorithm for multiplying A and B. Make necessary assumptions if required.	**07**

OR

Q.4	**(a)**	Write assembly language program to subtract two numbers.	**03**
	(b)	Explain status bit conditions with neat diagram.	**04**
	(c)	Elaborate CPU-IOP communication.	**07**
Q.5	**(a)**	State differences between hardwired control organization and microprogrammed control organization.	**03**
	(b)	Write the difference(s) between arithmetic shift left and logical shift left instruction. Support your answer with proper illustration.	**04**
	(c)	Write a detailed note on associative memory.	**07**

OR

Q.5	**(a)**	Explain memory hierarchy in brief.	**03**
	(b)	Write a brief note on peripheral devices.	**04**
	(c)	Discuss cache coherence problem in detail.	**07**

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