BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO/2024)

CLASS: BTECH
BRANCH: CSE/AIML

SEMESTER : III/ADD
SESSION : MO/2024

SUBJECT: CS235 COMPUTER ORGANIZATION AND RCHITECTURE

TIME:02 Hours

FULL MARKS: 25

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

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Q.1(a)	Give two differences for each of the following: (i)Computer Organization Vs Computer Architecture(ii)Von Neumann Vs Harvard Architecture (iii)RISC Vs CISC Processors	[2]	1	2
Q.1(b)	Explain the law of diminishing returns in contest of Amdhal's Law, Suppose aprocessor spends 85% of its time in memory operations when running a givenprogram A and its manufacturers make a change that improves its performance on memory access by a factor of 5,The program A originally took 120secs to execute. What is the speedup? What fraction of its execution timedoes the new system spend in memory operations?	[3]	1	3
Q.2(a)	The value of a float type variable is represented using the single-precision 32-bit floating-point format IEEE-754 standard that uses 1 bit for sign, 8 bitsfor the biased exponent, and 23 bits for mantissa. A float-type variable X is assigned the decimal value of −14.25. What is the representation of X in hexadecimal notation?	[2]	2	3
Q.2(b)	Explain the total gate delay for the n-bit Ripple Carry Adder .How is it minimized in corresponding Look Ahead Adder	[3]	1	6
Q.3(a)	Compare three-address, two-address, one-address, and zero-addressinstruction in terms of efficiency and cost.	[2]	2	2
Q.3(b)	The content of the top of the memory stack is 5320. The content of the stackpointer (SP) is 3560. A two-word call subroutine instruction is located in memory at address 1120 followed by the address field of 6720 at location 1121. What is the content of PC, SP, and top of the stack in the following situations? a. Before the call instruction is fetched from memory b. After the call instruction is executed c. After the return from the subroutine	[3]	2	3
Q.4(a)	Consider a processor with 64 registers and an instruction set of size twelve. Each instruction has five distinct fields, namely, opcode, two source registeridentifiers, one destination register identifier, and a twelve-bit immediate value. Each instruction must be stored in memory in a byte-aligned fashion.If a program has 100 instructions, then what is the amount of memory (in bytes) consumed by the program text?	[2]	2	3
Q.4(b)	Multiply using Booth's algorithm -8X12	[3]	2	5
Q.5(a)	Explain how the effective address is calculated for relative, indexed, andbase register addressing modes. Also, give at least one application of each of the above addressing modes with an example.	[2]	2	2
Q.5(b)	What is word length? Explain the factors that affect the word length	[3]	1	2

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