

Total No. of printed pages = 3

CSE 181402

Roll No. of candidate

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2023

B.Tech. 4th Semester End-Term Examination

COMPUTER ORGANIZATION AND ARCHITECTURE

New Regulation (w.e.f. 2017-18) & New Syllabus (w.e.f. 2018-19)

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer Question No. 1 and any *four* from the rest.

1. Answer the following questions :

(10 × 1 = 10)

(i) Generally dynamic RAM is used as main memory in a computer system as it

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|----------------------------|--------------------------------|
| (a) consumes less power | (b) has higher speed |
| (c) has lower cell density | (d) needs refreshing circuitry |

(ii) In computer, subtraction is generally carried out by

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|--------------------|---------------------|
| (a) 9's complement | (b) 10's complement |
| (c) 1's complement | (d) 2's complement |

(iii) The main memory in a personal computer is made of

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|------------------|----------------------|
| (a) cache memory | (b) static RAM |
| (c) dynamic RAM | (d) both (a) and (b) |

(iv) _____ register keeps tracks of the instructions stored in program stored in memory

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|----------------------|--------------------|
| (a) Address Register | (b) Index Register |
| (c) Program counter | (d) Accumulator |

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- (v) Micro programmed control organization uses
- Control logic, gates, FF etc
 - Made for instruction representation
 - Controlled information stored in memory
 - None of these
- (vi) The computer architecture aimed at reducing the time of execution of instructions is _____
- CISC
 - RISC
 - ISA
 - ANNA
- (vii) The flow of information among various units is controlled by Control Unit.
(False/True)
- (viii) Floating point representation is used to store
- Boolean values
 - Whole numbers
 - Real integers
 - Integers
- (ix) The addressing mode used in an instruction of the form ADD BL, CL is
- Register addressing
 - Direct addressing
 - Indirect addressing
 - Immediate addressing
- (x) In a memory-mapped I/O system, which of the following will not be there?
- LDA
 - IN
 - ADD
 - OUT

2. (a) What do you mean by instruction cycle? Briefly describe its phases. (5)

(b) Explain the general register organization of CPU with the help of a block diagram. (10)

3. (a) Explain fixed point and floating point representation of a number Represent (0.875) decimal in IEEE754 floating point representation. (5+5=10)

(b) Perform the step by step multiplication of $(3) * (7)$ using Booth's algorithm. (5)

4. (a) Discuss the architecture of 8086 microprocessor with proper block diagram. (10)

(b) What is addressing modes? Name four addressing modes from 8086. (5)

5. (a) Explain two stages pipelining? What are the pipelining hazards? Discuss the structural hazard pipelining. (5+2+5=12)
- (b) Explain the term locality of reference. Distinguish between temporal and spatial locality. (3)
6. (a) Difference between static and dynamic RAM. (5)
- (b) Explain the difference between polling and interrupt driven I/O. (5)
- (c) Explain the concept of DMA data transfer. (5)
7. (a) What is the fundamental idea of cache management? Explain about memory hierarchy. (2+6=8)
- (b) Given the page reference string as 701203042303231052. Calculate the number of pages faults using FIFO, LRU and optimal page replacement algorithm. (7)
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