Code No: **R201216** **R20** **SET - 1**

I B. Tech II Semester Regular/Supplementary Examinations, July/August- 2023

COMPUTER ORGANIZATION

(Common to CSE, IT)

Time: 3 hours Max. Marks: 70

Answer any five Questions one Question from Each Unit
All Questions Carry Equal Marks

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UNIT-I

1. a) What are the advantages of Grey codes? Discuss areas of application. [7M]
   b) Explain operations on unsigned binary numbers and Perform the subtraction with the following unsigned binary numbers using 2's compliment [7M]
   i) 11010-10000 iii) 11010-1101
   ii) 100-110000 iv) 1010100-1010100

(OR)

2. a) Explain two level realizations using OR- AND and NOR-NOR with an example. [7M]
   b) Simplify the expression F(A,B,C,D)=π(3,5,7,8,10,11,12,13) using K Map. [7M]

UNIT-II

3. a) Perform the realization of half adder and full adder using decoders and logic gates. [7M]
   b) Design and draw a full subtractor which will use two half subtractors. [7M]

(OR)

4. a) Design a 4-bit combinational logic to subtract one bit from the other. Draw the logic diagram using NAND and NOR Gates. [7M]
   b) What is a flip-flop? Design the basic flip-flop using NOR gates and explain the same. [7M]

UNIT-III

5. a) Explain various memory reference instructions an example. [7M]
   b) Design a 4-bit adder/Subtractor and explain its function. [7M]

(OR)

6. a) Explain the addition and subtraction of the floating point numbers with flow chart. [7M]
   b) Explain hardware implementation of Binary multiplier with example. [7M]

UNIT-IV

7. a) Explain the three techniques involved in addressing sequencing. [7M]
   b) Write about far and near procedures and Macros with 8086 programming.. [7M]

(OR)

8. a) Explain how conditional branching is achieved in microprogrammed control. [7M]
   b) Discuss various instruction sets available in 8086. [7M]

UNIT-V

9. a) Explain the features of segmented page mapping. [7M]
   b) Explain mapping in a segmented page memory unit with the help of a block diagram. What do you understand by translation? Look aside buffer. [7M]

(OR)

10 a) Explain the following mapping techniques used for cache mapping i) Associative mapping cache ii) Direct mapping cache iii) Block-set-associative mapping cache [7M]
   b) What is the difference between isolated IO and memory mapped I/O? State the advantages and disadvantages of each. [7M]

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Code No: **R201216** **R20** **SET - 2**

I B. Tech II Semester Regular/Supplementary Examinations, July/August- 2023

COMPUTER ORGANIZATION

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Time: 3 hours Max. Marks: 70

Answer any five Questions one Question from Each Unit
All Questions Carry Equal Marks

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UNIT-I

1. a) Draw the flowchart for adding or subtracting two floating point binary numbers. [7M]
   b) Simplify the expression $F(A,B,C)=\pi(0,3,6,7)$ using K Map. [7M]

(OR)

2. a) Differentiate between fixed point and floating point representation. [7M]
   b) Discuss the two-level NAND-NAND gate realization with an example. [7M]

UNIT-II

3. a) Discuss a few applications of multiplexers and distinguish between a multiplexer and adecoder. [7M]
   b) Define multiplexer. Construct a 4-to-1 multiplexer using logic gates. [7M]

(OR)

4. a) Draw the logic diagram of a 2 to the 4-line decoder using NOR gates, including an enable input. [7M]
   b) Design a 4-bit carry look ahead adder circuit. [7M]

UNIT-III

5. a) With a flow chart, explain the multiplication and division operations on two decimal Numbers P and Q. [7M]
   b) Derive and explain an algorithm for adding and subtracting two floating point binary numbers. [7M]

(OR)

6. a) Wrte about various instruction codes and its significance in detail. [7M]
   b) Design carry look-ahead adder and explain its function. [7M]

UNIT-IV

7. a) Explain the microinstruction format with examples. [7M]
   b) Write an assembly language program for calculating the factorial of a number using an 8086 microprocessor. [7M]

(OR)

8. a) Discuss how the fetch routine will be executed in microprogrammed control. [7M]
   b) Write an assembly language program for computing the sum of a given number using an 8086 microprocessor [7M]

UNIT-V

9. a) Explain the relation between address and memory space in a virtual memory Systems. [7M]
   b) What is cache memory? Explain the different mapping functions with suitable examples. [7M]

(OR)

10. a) Explain various phases of asynchronous data transfer.. [7M]
    b) Discuss how the address mapping is done in paging. [7M]

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Code No: **R201216** **R20** **SET - 3**

I B. Tech II Semester Regular/Supplementary Examinations, July/August- 2023

COMPUTER ORGANIZATION

(Common To CSE, IT)

Time: 3 hours Max. Marks: 70

Answer any five Questions, one Question from Each Unit
All Questions Carry Equal Marks

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UNIT-I

1. a) Distinguish between error detection and error correction. Explain with an example how Hamming code is used for error detection. [7M]
   b) Simplify the expression F(A, B, C, D) = ∑(0, 2, 5, 7, 8, 10, 13, 15)using K Map. [7M]

(OR)

2. a) "Parity checking can be used for error detection" – Justify your answer with an Example. [7M]
   b) Discuss the features of ASCII, Alphanumeric Codes with suitable examples. [7M]

UNIT-II

3. a) Explain how a half-adder can be realized by using one X-OR gate and one AND. [7M]
   b) Discuss the features of the T flip-flop. [7M]

(OR)

4. a) Design a Full adder using two NAND gates. [7M]
   b) Discuss the applications of multiplexers and demultiplexers with examples. [7M]

UNIT-III

5. a) Explain aaious registers and computer instructions in detail.. [7M]
   b) How addition and subtraction are done for decimal numbers? Give the pictorial representation for adding two decimal numbers [7M]

(OR)

6. a) Explain the basis for the Booths multiplication algorithm along with its constituent steps. What type of numbers will work? What are the limitations of the same? [7M]
   b) Draw and explain the division of floating point numbers [7M]

UNIT-IV

7. a) Discuss how a control unit initiates various microoperations. [7M]
   b) Write an assembly language program for printing the reverse of a given number using an 8086 microprocessor. [7M]

(OR)

8. a) Explain the unctions of Assembler, linker, locator and debugger in detail. [7M]
   b) Write an assembly language program for printing the first n prime number using 8086 microprocessor. [7M]

UNIT-V

9. a) Explain the importance of set associative mapping. [7M]
   b) What is auxiliary memory? Explain the various memory components used as auxiliary memory in computer systems. [7M]

(OR)

10. a) A two-way set associative cache memory uses blocks of four words. The cache can accommodate a total of 2048 words from the main memory. The main memory size is 128 K*32. i) Formulate all pertinent information required to construct the cache memory ii) What is the size of the cake memory. [7M]
    b) How to map a virtual address to a physical address? Explain address mapping with pages and associative memory page table. [7M]

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Code No: **R201216** **R20** **SET - 4**

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COMPUTER ORGANIZATION

(Common To CSE, IT)

Time: 3 hours Max. Marks: 70

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All Questions Carry Equal Marks

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UNIT-I

1. a) Explain different functional units of a digital computer with a neat sketch. [7M]
   b) Discuss the two-level NOR-NOR gate realization with an example. [7M]

(OR)

2. a) Perform the following: [7M]
   i) (110.101) 2 = ( )10 ii) (1.10101)2 = ( )10
   iii) (11010.1)2 = ( )10 iv) 110.10 x 10.1
   b) Discuss the two-level AND-OR gate realization with an example. [7M]

UNIT-II

3. a) Discuss how a full adder uses two NOR gates. [7M]
   b) Explain how a ripple counter can be realized by using T flip-flops. [7M]

(OR)

4. a) Design and draw a full adder that will use two half adders. [7M]
   b) Explain the need for a ring counter with a suitable example. [7M]

UNIT-III

5. a) Explain the phases of instruction cycle in detail. [7M]
   b) Explain how multiplication is done for floating point numbers with a flow chart [7M]

(OR)

6. a) Derive and explain an algorithm for adding and subtracting two floating point binary numbers. [7M]
   b) Give a flow chart for doing decimal division and also explain the sequence of operation of it. [7M]

UNIT-IV

7. a) Discuss the general register organization in a CPU. [7M]
   b) Explain how the macros, timing, and delay loops can be implemented in assembly language. [7M]

(OR)

8. a) Explain various addressing modes available in a CPU. [7M]
   b) Draw the Architecture of 8086 Processor. [7M]

UNIT-V

9. a) What is auxiliary memory? Explain the various memory components used as auxiliary memory in computer systems. [7M]
   b) Explain the following: i) Memory management using segmentation [7M]
   ii) Memory management using paging

(OR)

10. a) How to map a virtual address to a physical address? Explain address mapping with pages and associative memory page table. [7M]
    b) Explain the importance of cache memory and direct memory access with a suitable example. [7M]

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