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

I B. Tech II Semester Regular/Supplementary Examinations, August- 2022

COMPUTER ORGANIZATION

(Com. To CSE, IT)

Time: 3 hours Max. Marks: 70

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

Unit-I

1.	a)	Explain about Error detection and correction codes.	(7M)
	b)	Without reducing, implement the following expressions in AOI logic and then convert them into NAND logic and NOR logic i) A + BC + (A + B'C) + D ii) A+ B'C + (B+C)' + B'C'	(7M)
		Or	
2.	a)	How do you convert a gray number to binary? Generate a 4-bit gray code directly using the mirror image property?	(7M)
	b)	Construct a seven-bit error-correcting code to represent the decimal digits by augmenting the excess-3 code and by using odd-1 parity check.	(7M)

Unit-II

3.	a)	What is Binary Adder? Discuss and also draw the 4-bit Binary adder.	(7M)
	b)	Mention the drawback of JK flip flop? Design a flip flop which overcomes JK flip flop drawback with neat diagram.	(7M)
		Or	
4.	a)	What is a combinational logic circuit? Implement a Full adder using two half adders and one OR gate.	(7M)
	b)	Analyze latch with NOR gates, derive transition, flow and state tables.	(7M)

Unit-III

5.	a)	Discuss in detail booth multiplication algorithm with example.	(7M)
	b)	Perform floating point addition using the numbers 0.3 and 0.2675 use the floating point addition algorithm.	(7M)
		Or	
6.	a)	Explain briefly about different phases in instruction cycle.	(7M)
	b)	Present the basic computer organization and design with computer registers.	(7M)

Unit-IV

7.	a)	Explain organization of 8086 microprocessor system with neat sketch.	(8M)
	b)	Write a brief note on i) Assembler ii) Linker iii) Loader	(6M)
		Or	
8.	a)	Differentiate between microprogrammed control and hardwire control.	(7M)
	b)	What do you mean by assembly language programming? Write a program for sum of n digits using assembly language programming.	(7M)

Unit-V

9.	a)	Discuss about different modes of data transfer in input/output organization.	(7M)
	b)	What is associative memory? Why is it faster than main memory? Explain its hardware organization in detail.	(7M)
		Or	
10	a)	Draw and explain input/output interface circuit connecting a keyboard to asynchronous bus.	(7M)
	b)	Explain briefly about associate mapped and set associate mapped cache.	(7M)

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

I B. Tech II Semester Regular/Supplementary Examinations, August- 2022

COMPUTER ORGANIZATION

(Com. To CSE, IT)

Time: 3 hours Max. Marks: 70

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

Unit-I

1. a) Explain different methods used to represent negative numbers in binary system. (7M)
   b) Realize a 2 input EX-OR gate using minimum number of 2 input NAND gates. (7M)

Or

2. a) Perform the following binary arithmetic operations using I's complement and 2's complements. i) 1101.1101-1011.10 ii) Octal((642) -- (530)) (8M)
   b) Encode the decimal numbers using 6, 3, weighted code. Is it a self complementing code? Explain. (6M)

Unit-II

3. a) Implement 4-bit adder and 4-bit subtractor. (7M)
   b) Draw the circuit diagram of a 4-bit binary counter with parallel load and explain its working with its function table (7M)

Or

4. a) Derive and Implement Exclusive OR function involving three variables using only NAND function. (8M)
   b) Convert an SR Flip-Flop into JK Flip-Flop and explain. (6M)

Unit-III

5. a) Write about different operations used in computer arithmetic. (7M)
   b) Perform the restoring division for the binary numbers 1010 and 11. Draw the circuit arrangement for binary division. (7M)

Or

6. a) Explain different types of computer instructions. (7M)
   b) How addition and subtraction is done for decimal numbers? Give the pictorial representation for adding two decimal numbers. (7M)

Unit-IV

7. a) Explain briefly about arithmetic, logical and shift instructions. (9M)
   b) Justify the: Need of assembler directives and emulators. (5M)

Or

8. a) Discuss in detail on design of control unit in micro programmed control. (7M)
   b) Explain about 8086 instruction set and Pin diagram. (7M)

Unit-V

9. a) Explain about handshaking between master and slave in asynchronous mode. (7M)
   b) Discuss in detail different types of mapping functions in cache memory. (7M)

Or

10. a) Mention the standard I/O interfaces and describe the each one. (7M)
    b) Explain briefly about memory hierarchy and discuss size and performance parameters. (7M)

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

I B. Tech II Semester Regular/Supplementary Examinations, August- 2022

COMPUTER ORGANIZATION

(Com. To CSE, IT)

Time: 3 hours Max. Marks: 70

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

Unit-I

1. a) Convert (AB6.13) into its octal equivalent and convert (675.42), into base-16 number. (7M)
   b) Discuss briefly about Self-Complementing Codes and Cyclic Codes (7M)

Or

2. a) Using the k-map method express the function in standard SOP form. F=AB+ AC +C+ AD+AB'C+ ABC (7M)
   b) Explain about Two-level realizations using gates (7M)

Unit-II

3. a) Design a 4-bit combinational circuit decrementer using 4 full adder circuits. (9M)
   b) Draw the logic diagram of a 4-to-1 line multiplexer with logic gates (5M)

Or

4. a) Draw the circuit of a BCD adder / subtractor and explain its operations (7M)
   b) Explain 4-bit shift register using D flip-flops & it's working with the help of timing diagrams. (7M)

Unit-III

5. a) Discuss in detail about memory reference instructions. (9M)
   b) Elaborate on multiplication process using Booth algorithm when the following binary numbers are multiplied (+15) * (-13). (6M)

Or

6. a) Explain about addition and subtraction for the floating point numbers with flow chart. (7M)
   b) Discuss every field of instruction format and also register structure. (7M)

Unit-IV

7. a) Illustrate the use of while-do and Repeat-Until in 8086 Programming. (8M)
   b) Write a short note on data manipulation instructions. (6M)

Or

8. a) What is control memory? Explain the address sequencing mechanism. (7M)
   b) Summarize on the following concepts: 1) far and near procedures 2) macros (7M)

Unit-V

9. a) Enumerate the concept of auxiliary memory in detail. (7M)
   b) Write about data transfer that does not uses clock cycle for synchronization. (7M)

Or

10. a) Define DMA and draw the two-channel DMA controller and explain it. (8M)
    b) Explain the concept of set-associative mapping. (6M)

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

I B. Tech II Semester Regular/Supplementary Examinations, August- 2022

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Time: 3 hours Max. Marks: 70

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

Unit-I

1. a) Perform the following addition using excess-3 code. (7M)
   i) 386 + 756 ii) 1010+444
   b) Write about Fixed Point Representation and Floating Point Representation. (7M)

Or

2. a) Using the k-map method minimize (7M)
   F= A'B'C' + AB'D + A'BC + A'CD + A'B'D+ A'CD' + A'C'D'
   b) Perform the subtraction using I's complement and 2's complement methods. (7M)
   i)11010 10111 (ii)110001010 (iii)1110110000

Unit-II

3. a) Design carry look ahead adder and explain its function. (7M)
   b) Explain 4-bit bidirectional shift register with a neat sketch. (7M)

Or

4. a) Analyze on full adder using two half adders and logic gate with a neat diagram. (7M)
   b) Design a 4 bit synchronous counter with D flip - flops and explain its working (7M)

Unit-III

5. a) Explain about arithmetic instructions with suitable examples each. (5M)
   b) Multiple $(-9)_{10}$ with $(4)_{10}$ by using Booth's multiplication. Give the flow table of the multiplication (9M)

Or

6. a) What is an I/O interface? What are the functions of typical I/O interface? Explain. (9M)
   b) Elaborate on the concept of interrupt cycle and its role in computer organization. (5M)

Unit-IV

7. a) Explain the basic computer instruction formats with register organization. (7M)
   b) Implement 8086 programming using it-then-else, and string operations. (7M)

Or

8. a) What is the role of control unit? Give an example of micro program. (8M)
   b) Give a brief description on locator, linker and debugger, Loader. (6M)

Unit-V

9. a) What is an interrupt? What are the different types of interrupts known to you describe briefly? (7M)
   b) How is data transmitted between main memory and secondary memory using DMA? (7M)

Or

10. a) Differentiate synchronous and asynchronous data transfer modes. (7M)
    b) Explain cache memory and write its importance. Relate it with auxiliary memory. (7M)

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