SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS), PUTTUR

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QUESTION BANK (DESCRIPTIVE)

Subject with Code: Digital Logic and Computer Organization (23CS0506)
Course & Branch: B.Tech –CSM, CAD & CAI
Year & Semester: II - B.Tech. & II-Semester **Regulation:** R23

UNIT I
PART-A (2 MARKS)

1.	**(a)**	What is binary number system?	**[L1][CO1]**	**[2M]**
	(b)	What is an Excess3 code?	**[L1][CO1]**	**[2M]**
	(c)	What are the basic properties of Boolean algebra?	**[L1][CO1]**	**[2M]**
	(d)	List out the names of basic logical operators.	**[L1][CO1]**	**[2M]**
	(e)	List the names of universal gates with symbols	**[L1][CO1]**	**[2M]**

PART-B (10 MARKS)

2.	**a)**	Differentiate between floating point representation and fixed-point representation.	**[L2][CO1]**	**[5M]**
	b)	What is number system? explain the different types of number systems	**[L1][CO1]**	**[5M]**
3	**a)**	Convert the $(555)_{10}$ into binary, octal and Hexadecimal number systems.	**[L2][CO1]**	**[5M]**
	b)	Convert the following into binary to decimal i) $(1101.1)_2$ ii) $(1100.001)_2$	**[L2][CO1]**	**[5M]**
4	**a)**	Convert the following into decimal into hexa decimal i) $(5386.34)_{10}$ ii) $(214.35)_{10}$	**[L2][CO1]**	**[5M]**
	b)	Represent signed numbers from +7 to -8 using different ways of representation.	**[L2][CO1]**	**[5M]**
5		Explain the Binary codes with examples.	**[L2][CO1]**	**[10M]**
6	**a)**	List the Basic Logic functions.	**[L1][CO1]**	**[3M]**
	b)	Explain about Basic Logic gates with symbols and truth table.	**[L2][CO1]**	**[7M]**
7	**a)**	Explain about Universal Logic gates with symbols and truth table.	**[L2][CO1]**	**[5M]**
	b)	Prove the following identities: A' B' C' + A' B C' + A B' C' + A B C' = C' A B + A B C + A' B + A B' C = B + A C	**[L3][CO1]**	**[5M]**
8	**a)**	Simplify the following Boolean Expressions: A'C'+ABC+AC'+AB to three literals. A'B (D'+C'D) +B (A+A'CD) to one literal.	**[L4][CO1]**	**[5M]**
	b)	Simplify the given Boolean expression using K-map $F(A,B,C,D)= \sum m(0,2,3,8,10,11,12,14)$	**[L4][CO1]**	**[5M]**
9	**a)**	Simplify the following Boolean expressions using K-map i) $F(x, y, z) = \sum m(2, 3, 4, 5)$ ii) $F(x, y, z) = \sum m(3, 4, 6, 7)$.	**[L4][CO1]**	**[5M]**
	b)	Define combinational circuit and explain the procedure for designing a combinational circuit.	**[L1][CO1]**	**[5M]**
10	**a)**	Explain about Binary Half Adder with truth table and logic diagram.	**[L2][CO1]**	**[5M]**
	b)	Design and draw a full adder circuit.	**[L6][CO1]**	**[5M]**
11	**a)**	Define Decoder and explain in detail about a 2-to-4-line binary decoder.	**[L1][CO1]**	**[5M]**
	b)	Design and implement the following Boolean function by 8:1 Multiplexer. $(A,B,C.D)=\Sigma m(0,1,2,5,7,8,9,14,15)$.	**[L6][CO1]**	**[5M]**

UNIT II

PART-A (2 MARKS)

1.	**(a)**	Define a sequential circuit and draw its block diagram.	**[L1][CO1]**	**[2M]**
	(b)	What is Flipflop and different types of Flipflop?	**[L1][CO1]**	**[2M]**
	(c)	List the types of Buses.	**[L1][CO2]**	**[2M]**
	(d)	Sketch the basic functional units of computer.	**[L3][CO2]**	**[2M]**
	(e)	List the Classification of Computer Generations.	**L1][CO2]**	**[2M]**

PART-B (10 MARKS)

2.	**a)**	Differentiate between Combinational & Sequential circuits.	**[L4][CO1]**	**[5M]**
	b)	Distinguish between latches and flipflops.	**[L4][CO1]**	**[5M]**
3	**a)**	Explain the working principle of SR and JK flip-flops	**[L2][CO1]**	**[5M]**
	b)	Explain the working principle of T and D flip-flops.	**[L2][CO1]**	**[5M]**
4	**a)**	What is a counter? List the applications of counters.	**[L1][CO1]**	**[5M]**
	b)	Explain in detail about 3-bit ripple Up-counter using suitable diagram.	**[L2][CO1]**	**[5M]**
5		Define a Register. Explain in detail about various Shift Registers.	**[L1][CO1]**	**[10M]**
6	**a)**	List the different types of a computer.	**[L1][CO2]**	**[5M]**
	b)	Explain the functional units in the computer.	**[L2][CO2]**	**[5M]**
7	**a)**	Differentiate between I/O unit and memory unit.	**[L4][CO2]**	**[5M]**
	b)	Differentiate between control unit and ALU.	**[L4][CO5]**	**[5M]**
8		Describe the Basic Operational Concepts of computer with neat diagram.	**[L2][CO3]**	**[10M]**
9	**a)**	Give the Structure of BUS Interface with various devices in computer.	**[L2][CO6]**	**[5M]**
	b)	Explain briefly about the software of a computer.	**[L2][CO6]**	**[5M]**
10	**a)**	Explain briefly about the performance of a computer.	**[L2][CO2]**	**[5M]**
	b)	Explain briefly about the multiprocessors and multi computers of a computer.	**[L2][CO2]**	**[5M]**
11	**a)**	List the different types of computer generations.	**[L1][CO2]**	**[5M]**
	b)	Explain briefly about the Von- Neumann Architecture of a computer.	**[L2][CO3]**	**[5M]**

UNIT III

PART-A (2 MARKS)

1.	**(a)**	Represent -7 in signed magnitude, 1s complement and 2s complement	**[L2][CO1]**	**[2M]**
	(b)	What is the advantage of using Booth algorithm?	**[L5][CO1]**	**[2M]**
	(c)	What is floating point numbers?	**[L2][CO1]**	**[2M]**
	(d)	What are the basic operations to execute a complete instruction?	**[L1][CO3]**	**[2M]**
	(e)	What is the need of multiple organization?	**[L2][CO3]**	**[2M]**

PART-B (10 MARKS)

2.	**a)**	Explain the Flow chart for Addition and Subtraction.	**[L2][CO3]**	**[5M]**
	b)	Subtract 1101 and -1001 using 2's complement subtractions.	**[L5][CO1]**	**[5M]**
3	**a)**	Explain the working of a Ripple carry adder.	**[L2][CO1]**	**[5M]**
	b)	Illustrate the steps in Booth multiplication flow chart. Show the step by step signed multiplication of (-7) and (-11) using Booth algorithm	**[L3][CO1]**	**[5M]**
4		Develop flowchart for the Multiplication of floating-point number and illustrate with an example.	**[L6][CO1]**	**[10M]**
5		Develop and discuss the Flow chart for Division of numbers Give the step-by-step procedure to Divide 11 with 3 and find the results	**[L6][CO1]**	**[10M]**
6		Develop flow chart for the addition/subtraction of floating-point number and illustrate with an example.	**[L6][CO1]**	**[10M]**
7.		Explain the fundamental concept in processor organization?	**[L3][CO3]**	**[10M]**
8.		Describe the execution of a complete instruction?	**[L2][CO3]**	**[10M]**
9.	**a)**	Explain the multiple bus organization.	**[L3][CO3]**	**[6M]**
	b)	Differentiate between Hardwired Control and Micro-programmed control.	**[L2][CO4]**	**[4M]**
10.		What is Hardwired Control? Explain in detail with a neat diagram.	**[L3][CO4]**	**[10M]**
11.		What is micro programed Control? Explain in detail with a neat diagram.	**[L3][CO4]**	**[10M]**

UNIT IV

PART-A (2 MARKS)

1.	**(a)**	What is the need of memory?	**[L2][CO5]**	**[2M]**
	(b)	Define main memory and auxiliary memory	**[L5][CO5]**	**[2M]**
	(c)	Classify main memory and secondary memory?	**[L2][CO5]**	**[2M]**
	(d)	What is cache memory?	**[L1][CO5]**	**[2M]**
	(e)	Define virtual memory?	**[L2][CO5]**	**[2M]**

PART-B (10 MARKS)

2.		Explain different types of ROM memories in detail?	**[L2][CO5]**	**[10M]**
3.		Categorize the semiconductor RAM in detail.	**[L4][CO5]**	**[10M]**
4.	**a)**	Describe about memory hierarchy concept in detail?	**[L1][CO5]**	**[5M]**
	b)	Discuss the speed, size and cost of a memory?	**[L2][CO5]**	**[5M]**
5.	**a)**	Explain 128*8 RAM with block diagram and function table.	**[L3][CO5]**	**[6M]**
	b)	Distinguish between SRAM & DRAM?	**[L2][CO5]**	**[4M]**
6.		Explain how memories connected with CPU with diagram.	**[L3][CO5]**	**[10M]**
7.	**a)**	What is cache memory? What is hit and miss in the cache memory.	**[L2][CO5]**	**[5M]**
	b)	List and explain different mapping in Cache memory	**[L2][CO5]**	**[4M]**
8.	**a)**	Compare the various cache mapping techniques.	**[L2][CO5]**	**[5M]**
	b)	What are the performance considerations in cache memory?	**[L2][CO5]**	**[5M]**
9.	**a)**	What is Virtual Memory? Discuss how address mapping using pages.	**[L2][CO5]**	**[5M]**
	b)	Compare Cache and virtual memory?	**[L2][CO5]**	**[5M]**
10.	**a)**	Describe in detail about the memory management requirements.	**[L1][CO5]**	**[5M]**
	b)	Compare various types of secondary storage systems.	**[L2][CO5]**	**[5M]**
11.	**a)**	Describe the secondary storage and explain with a neat block diagram.	**[L1][CO5]**	**[5M]**
	b)	Compare Cache and Auxiliary memories?	**[L2][CO5]**	**[5M]**

UNIT V

PART-A (2 MARKS)

1.	**(a)**	Define debugging?	**[L1][CO6]**	**[2M]**
	(b)	What is interrupt and classify?	**[L1][CO6]**	**[2M]**
	(c)	Classify interface circuits?	**[L1][CO6]**	**[2M]**
	(d)	What are the examples of processor?	**[L1][CO6]**	**[2M]**
	(e)	What is the need of buses and classify the bus structure?	**[L1][CO6]**	**[2M]**

PART-B (10 MARKS)

2.		Explain how to access input and output devices in detail?	**[L3][CO6]**	**[10M]**
3.		Explain the interrupts in input/output organization?	**[L3][CO6]**	**[10M]**
4.	**a)**	Explain the interrupt Nesting?	**[L3][CO6]**	**[5M]**
	b)	Explain about interrupt service routine (ISR)?	**[L3][CO6]**	**[5M]**
5.		Give detailed notes on DMA transfers with neat sketch.	**[L2][CO6]**	**[10M]**
6.	**a)**	Distinguish between Centralized arbitration and Distributed arbitration?	**[L2][CO6]**	**[5M]**
	b)	What is the need of BUS and explain different types in detail?	**[L1][CO6]**	**[5M]**
7.		Types of interfacing circuits and explain it?	**[L2][CO6]**	**[10M]**
8.		Explain the standard I/O devices?	**[L3][CO6]**	**[10M]**
9.		Draw the USB architecture and explain it?	**[L1][CO6]**	**[10M]**
10.	**a)**	Draw the PCI bus architecture and explain its operation?	**[L1][CO6]**	**[5M]**
	b)	Explain about SCSI BUS in detail?	**[L3][C06]**	**[5M]**
11.	**a)**	Compare data, address and control buses?	**[L2][CO6]**	**[5M]**
	b)	Explain about input and output interface circuits?	**[L3][CO6]**	**[5M]**

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