SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS), PUTTUR

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QUESTION BANK (DESCRIPTIVE)

Subject with Code: COMPUTER ARCHITECTURE & ORGANIZATION (23EC0427)
Course & Branch: B.Tech –ECE
Year & Semester: III - B.Tech. & I-Semester   **Regulation:** R23

UNIT I
PART-A (2 MARKS)

1.	(a)	Draw and label the block diagram of a digital computer.	[L1][CO1]	[2M]
	(b)	Differentiate between arithmetic micro-operations and logic micro-operations.	[L2][CO1]	[2M]
	(c)	List the any two purpose of the Instruction Cycle in a basic computer.	[L1][CO1]	[2M]
	(d)	What are the different computer registers? List and brief the function of each.	[L1][CO1]	[2M]
	(e)	What is Register Transfer Language (RTL)? Give one example of a register transfer statement.	[L1][CO1]	[2M]

PART-B (10 MARKS)

2.	a)	Explain in brief about different functional units of a computer.	[L2][CO1]	[5M]
	b)	Differentiate between Computer Organization, Computer Design, and Computer Architecture with suitable examples.	[L2][CO1]	[5M]
3.	a)	Explain Register Transfer Language (RTL) with suitable examples.	[L2][CO2]	[5M]
	b)	Discuss Arithmetic Micro-operations. Illustrate with examples.	[L2][CO2]	[5M]
4.	a)	Illustrate the Memory transfers using Register transfer notation?	[L3][CO2]	[5M]
	b)	Describe Bus and Memory Transfer operations in detail with diagrams.	[L2][CO2]	[5M]
5.		Elaborate the details of Common Bus system using of four registers with a neat Sketch?	[L2][CO2]	[10M]
6.	a)	Explain Logic Micro-operations and their applications in digital systems.	[L2][CO2]	[5M]
	b)	Write short notes on Shift Micro-operations and their significance.	[L2][CO2]	[5M]
7.	a)	Explain the different types of Instruction Codes with examples.	[L2][CO3]	[5M]
	b)	Discuss the role of Computer Registers in instruction execution.	[L2][CO3]	[5M]
8.	a)	Describe the types of Computer Instructions and their formats.	[L4][CO3]	[5M]
	b)	Explain Timing and Control in a computer system with neat diagrams.	[L2][CO3]	[5M]
9.	a)	Describe the Instruction Cycle in detail with the help of a flowchart.	[L4][CO3]	[5M]
	b)	Discuss Memory Reference Instructions with examples.	[L2][CO3]	[5M]
10.	a)	Explain the concept of Input–Output and Interrupt handling in computer organization.	[L2][CO3]	[5M]
	b)	Differentiate a Subroutine and Nested subroutine?	[L2][CO3]	[5M]

UNIT II

PART-A (2 MARKS)

1.	(a)	What is Control Memory in microprogrammed control?	[L1][CO1]	[2M]
	(b)	What is Address Sequencing?	[L1][CO1]	[2M]
	(c)	Give one example each for Immediate and Direct Addressing.	[L2][CO2]	[2M]
	(d)	Define Program Control instructions.	[L1][CO2]	[2M]
	(e)	What is a Microprogram Counter?	L1][CO2]	[2M]

PART-B (10 MARKS)

2.	a)	Explain the concept of Control Memory and its role in microprogrammed control.	[L2][CO4]	[5M]
	b)	Describe Address Sequencing in a microprogrammed control unit with a neat diagram.	[L4][CO4]	[5M]
3.	a)	With a suitable example, explain how a microprogram is executed.	[L2][CO4]	[5M]
	b)	Discuss the design of a Microprogrammed Control Unit in detail.	[L2][CO4]	[5M]
4.	a)	Differentiate between Hardwired Control and Microprogrammed Control.	[L2][CO4]	[5M]
	b)	Explain the advantages and disadvantages of Microprogrammed Control Organization.	[L2][CO4]	[5M]
5.		Explain the General Register Organization of a CPU with neat diagrams.	[L2][CO3]	[10M]
6.	a)	Describe the different Instruction Formats with suitable examples.	[L4][CO3]	[5M]
	b)	Describe zero-address and three-address instruction formats with examples.	[L4][CO3]	[5M]
7.	a)	Differentiate between Direct and Indirect Addressing modes with examples.	[L2][CO3]	[5M]
	b)	Write short notes on arithmetic manipulation instructions.	[L2][CO3]	[5M]
8.		Discuss various Addressing Modes and illustrate with examples.	[L2][CO3]	[10M]
9.		Write short notes on: (a) Instruction Format types (b) Program Control flow.	[L2][CO3]	[10M]
10	a)	Explain Data Transfer and Manipulation instructions in detail.	[L2][CO3]	[5M]
	b)	Describe Conditional and Unconditional Branching in program control.	[L4][CO3]	[5M]

UNIT III

PART-A (2 MARKS)

1.	(a)	What is the difference between integer and floating-point data?	[L1][CO3]	[2M]
	(b)	State one advantage of using 2's complement representation.	[L1][CO3]	[2M]
	(c)	Represent +13 and –13 in 8-bit signed fixed point form.	[L2][CO3]	[2M]
	(d)	Differentiate between restoring and non-restoring division.	[L2][CO5]	[2M]
	(e)	What is floating point numbers?	[L1][CO5]	[2M]

PART-B (10 MARKS)

2.	a)	Differentiate between signed and unsigned data types. Give examples of each.	[L2][CO1]	[5M]
	b)	Discuss the importance of complements in binary subtraction with examples.	[L2][CO2]	[5M]
3.	a)	Represent +25 and –25 in 8-bit Fixed Point format using (a) Sign-Magnitude, (b) 1's complement, and (c) 2's complement.	[L2][CO3]	[5M]
	b)	Explain the different types of data used in computers with suitable examples.	[L1][CO1]	[5M]
4.		Explain Fixed Point representation with examples. Compare Sign-Magnitude, 1's complement, and 2's complement forms.	[L2][CO3]	[10M]
5.		Explain Floating Point representation with neat diagrams.	[L2][CO3]	[10M]
6.		Explain the Flow chart for Addition and Subtraction.	[L2][CO3]	[10M]
7.		Discuss the Multiplication algorithm with Shift and add method with suitable flowchart. Multiply the binary numbers (01011) and (01101) Using Shift and add method	[L3][CO3]	[10M]
8.		Illustrate the steps in Booth multiplication flow chart. Show the step by step signed multiplication of (-7) and (-11) using Booth algorithm.	[L3][CO3]	[10M]
9.		Develop and discuss the Flow chart for Division of numbers Give the step by step procedure to Divide 01101010100 with 10001and find the results.	[L3][CO5]	[10M]
10.	a)	What is Decimal arithmetic unit?Explain the importance in computer system.	[L1][CO3]	[4M]
	b)	What are the different arithmetic operations? Explain with an example.	[L2][CO3]	[6M]

UNIT IV

PART-A (2 MARKS)

1.	(a)	What is the need for an I/O interface in a computer?	[L2][CO1]	[2M]
	(b)	Write two methods of asynchronous data transfer.	[L2][CO2]	[2M]
	(c)	Classify main memory and secondary memory?	[L1][CO1]	[2M]
	(d)	What is cache memory?	[L2][CO2]	[2M]
	(e)	Define Direct Memory Access (DMA).	[L2][CO2]	[2M]

PART-B (10 MARKS)

2.	a)	Describe the Connection for Processor, Keyboard and Display.	[L2][CO2]	[5M]
	b)	Differentiate RAM & ROM memories.	[L2][CO4]	[5M]
3.		Explain in detail about strobe control method of asynchronous data transfer.	[L2][CO2]	[10M]
4.	a)	Classify and describe the possible modes of data transfer to and from peripherals with examples.	[L2][CO2]	[5M]
5.		Explain Daisy-Chaining priority and Parallel priority Interrupt with its hardware diagram.	[L3][CO2]	[10M]
6.	a)	With a neat schematic, Explain about DMA controller and its mode of data transfer.	[L3][CO4]	[5M]
	b)	Justify how DMA bypasses CPU and speeds up the memory operation.	[L5][CO2,4]	[5M]
7.	a)	Discuss the Memory Hierarchy in computer system with regard to Speed, Size and Cost.	[L4][CO4]	[5M]
	b)	Explain about main memory and its types.	[L2][CO4]	[5M]
8.	a)	Write about Auxiliary memory devices.	[L1][CO4]	[3M]
	b)	Explain the mechanism involved in Magnetic Disks and Magnetic Tapes.	[L2][CO4]	[7M]
9.		Brief out the hardware organization of Associative memory with diagrams.	[L3][CO4]	[10M]
10	a)	What is Locality of Reference and explain about Cache memory in detail.	[L4][CO6]	[5M]
	b)	Illustrate the mapping process involved in transformation of data from main to Cache memory.	[L3][CO6]	[5M]

UNIT V

PART-A (2 MARKS)

1.	(a)	Write two characteristics of CISC.	[L1][CO1]	[2M]
	(b)	Define pipelining.	[L2][CO2]	[2M]
	(c)	What is inter-processor arbitration?	[L2][CO3]	[2M]
	(d)	Define inter-processor communication.	[L2][CO3]	[2M]
	(e)	What is cache coherence?	[L2][CO3]	[2M]

PART-B (10 MARKS)

2.	a)	Explain the characteristics of CISC architecture with examples.	[L2][CO5]	[5M]
	b)	Differentiate between RISC and CISC architectures.	[L4][CO5]	[5M]
3.	a)	Justify how parallel processing improves the performance of multiprocessing environment?	[L5][CO6]	[5M]
	b)	Comparison between tightly coupled and loosely coupled multiprocessors.	[L4][CO6]	[5M]
4.		Classify organization of computers using Flynn's criteria.	[L2][CO6]	[10M]
5.	a)	Illustrate the behavior of a pipeline using space-time diagram.	[L3][CO6]	[5M]
	b)	How many clock cycles are required to complete n-tasks in k-segment pipeline?	[L3][CO6]	[5M]
6.		Sketch the flowchart for floating point Addition and subtraction in arithmetic pipeline.	[L3][CO3]	[10M]
7.		Construct 4-segment Instruction Pipeline and explain.	[L3][CO6]	[10M]
8.		Explain the characteristics of Multiprocessor and define the technique used to alleviate the problem in single module.	[L2][CO6]	[10M]
9.	a)	Explain in detail about the bus in interconnection network.	[L2][CO4]	[5M]
	b)	Explain cross bar switch with neat sketch.	[L2][CO6]	[5M]
10.	a)	Analyze the multiprocessor interconnection networks (crossbar, mesh, hypercube).	[L4][CO6]	[7M]
	b)	What is cache coherence?	[L4][CO6	[3M]