



# MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)  
Rasipuram - 637 408, Namakkal Dist., Tamil Nadu.

## Department of Information Technology Question Bank - Academic Year (2020-21)

Course Code & Course Name : 19ITC06 & Computer Organization and Architecture  
Year/Sem/Sec : II/III/-

### Unit-I: Introduction

#### Part-A (2 Marks)

1. Define the term Computer Architecture (CO1,K1)
2. What is program controlled I/O (CO1,K1)
3. What is Bus? (CO1,K1)
4. Define Pipeline processing. (CO1,K1)
5. Draw the basic functional units of a computer.
6. Define clock rate. (CO1,K1)
7. What is register? (CO1,K1)
8. Write the basic performance equation? (CO1,K1)
9. Write down the operation of control unit? (CO1,K2)
10. Define Addressing modes. (CO1,K1)

#### Part-B (16 Marks)

1. Draw and explain block diagram of simple computer with the functional units.(CO1,K2) (16)
2. Why do we use addressing modes ?Explain the different types of Addressing modes with example (CO1,K2) (16)
3. Explain the various techniques meant for improving the performance of a computer (CO1,K2) (16)
4. Write a program for Instruction and instruction sequencing with its operation. (CO1,K6) (16)
5. What is bus explain it in detail? (CO1,K6) (16)

### Unit-II : Arithmetic Unit

#### Part-A (2 Marks)

1. What is floating point number system?(CO2,K1)
2. Draw the half adder circuit and give the truth table.(CO2,K1)
3. Write the logic equations of a binary half adder.(CO2,K2)
4. State the rules of floating point multiplication.(CO2,K1)
5. How bit pair recoding of multiplier speeds up the multiplication process?(CO2,K1)

6. What is a ripple carry adder?(CO2,K1)
7. State the principle behind the Booth's multiplier. (CO2,K1)
8. State the role of Booth's algorithm in the design of fast multipliers.(CO2,K1)
9. Define IEEE floating point single and double precision standard.(CO2,K1)
10. In conforming to the IEEE standard mention any four situations.(CO2,K1)

**Part-B (16 Marks)**

1. Explain the Representations of Floating point numbers in detail.(CO2,K6) (16)
2. Describe the algorithm to multiply two positive numbers.Also discuss the realization of a multiplier to implement the same (CO2,K6) (16)
3. Illustrate Booth's algorithm with an example. (CO2,K6) (16)
4. Demonstrate the division of  $1100_2$  by  $101_2$  using restoring method, draw block diagram and explain the operation (CO2,K6) (16)
5. State and Explain the rules in arithmetic operations on floating point numbers.(CO2,K6) (16)

**Unit-III : Pipelinig and Hazards**

**Part-A (2 Marks)**

1. Draw the four stages in the pipelining.(CO3,K2)
2. Compare Instruction Pipelining and hazard in pipelining.(CO3,K1)
3. State instruction or control hazard.(CO3,K1)
4. Difference between delayed load and delayed slot.(CO3,K1)
5. What would be the effect, if we increase the number of pipelining stages? (CO3,K1)
6. List out the classification of data hazards? (CO3,K1)
7. Give an example on the instruction pipelining? (CO3,K1)
8. Why is branch prediction algorithm needed? (CO3,K1)
9. Write a note branch target buffer? (CO3,K1)
10. Differentiate between the static and dynamic branch prediction.(CO3,K1)

**Part-B (16 Marks)**

1. Explain basic operation of a Four Stage pipelining with a neat diagram(CO3,K2) (16)
2. Discuss the various hazards that might arise in a pipeline(CO3,K2) (16)
3. What is a Data hazard? How do you overcome it? And discuss its side effects. (CO3,K2) (16)
- 4.(i) Describe the methods for dealing with the branch hazards.(CO3,K2) (8)
- 4.(ii) Discuss in detail about hazards due to unconditional branching.(CO3,K2) (8)
5. What are the hazards of conditional branches in pipelines? How it can be resolved? (CO3,K6) (16)

**Unit-IV : Memory System**

**Part-A (2 Marks)**

1. What will be the width of address and data buses for a 512 K \* 8 memory chip? (CO4,K1)
2. Distinguish between static RAM and dynamic RAM. (CO4,K1)
3. Give the features of a ROM. (CO4,K1)
4. Compare SDRAM with DDR SDRAM(CO4,K1)
5. How do you construct a 8 m \* 32 memory using 512 K \*8 memory chips? (CO4,K1)
6. What is double data rate SDRAMs? (CO4,K1)
7. Define locality of reference. What are its types? (CO4,K1)
8. List the mapping techniques.(CO4,K1)
9. Write a note by interleaved memory? (CO4,K1)
10. An address space is specified by 24-bits and the corresponding memory space by 16-bits:How many words are there in the virtual memory and main memory? (CO4,K1)

#### **Part-B (16 Marks)**

- 1.(i). Analyze the memory hierarchy in terms of speed, size and Cost.(CO4,K2) (8)
- 1.(ii). Draw the block diagram of Virtual memory and explain.(CO4,K2) (8)
2. Explain the need for cache memory and Discuss the various mapping techniques used in cache memories. (CO4,K2) (16)
3. Write about mapping function? What are the ways the cache can be mapped?(CO4,K2) (16)
4. Illustrate the different types of mapping functions in cache memory. (CO4,K2) (16)
5. What is virtual memory? Explain how the logical address is translated into physical address in the virtual memory system with a neat diagram.(CO4,K2) (16)

### **Unit-V : Input/Output Organization**

#### **Part-A (2 Marks)**

1. What is the use of DMA.(CO5,K1)
2. Specify the different I/O transfer mechanisms available.(CO5,K1)
3. What does isochronous data stream means?(CO5,K1)
4. List out the Input and output devices.(CO5,K1)
5. Give the features of PCI.(CO5,K1)
6. Compare SCSI and USB.(CO5,K1)
7. State Interrupt and ISR.(CO5,K1)
8. Draw the memory hierarchy of memory system.(CO5,K1)
9. What are the units of interface?(CO5,K1)
10. Write a short notes on Buses and its types.(CO5,K1)

#### **Part-B (16 Marks)**

1. Describe the various mechanism for accessing I/O devices.(CO5,K2) (16)
2. Explain the interrupt priority schemes. (CO5,K2) (16)

3. Explain the different types of interrupts and the different ways of handling interrupt.(CO5,K2) (16)
4. With a neat sketch explain the working principle of DMA. (CO5,K2) (16)
5. Write an elaborated note on PCI, SCSI and USB bus standards.(CO5,K2) (16)

**Course Faculty**

**HoD**