Date: 22-02-2022

COMPUTER ORGANIZATION and ARCHITECTURE

Expected Questions:

UNIT-I

1. Block diagram of digital computer.
2. Differentiate between computer architecture and computer organization **(don't skip)**
3. Block diagram of register transfer along with RTL notations.
4. Common bus transfer (Using multiplexers and three state buffers) **(don't skip) (practice diagrams)**
5. Explain single-stage adder/subtractor. **(Diagram and truth table)**
6. Explain single-stage logic micro-operations. **(Diagram and truth table)**
7. Explain shift logical micro-operations. **(Practice with some examples which was discussed in class)**
8. Draw and explain the single state arithmetic and logic shift unit. **(Practice diagram only)**
9. Explain Stored program memory organization. (Practice diagram)
10. Flow chart for instruction cycle.
11. Explain all memory-reference instructions.
12. Explain input and output control flow instruction. **(Practice diagram)**
13. Explain the concept of interrupts and the associated flow chart for the interrupt cycle.

UNIT-II

1. Differentiate between hardwired and microprogrammed control organizations. (don't skip)
2. Explain the block diagram of microprogrammed control unit organization.
3. Explain the address sequencing mechanism in a microprogrammed control unit.
4. Draw and explain the microinstruction format. (Mapping Process)
5. Draw and explain the design of the control unit. **(Practice diagram)**
6. Explain the addressing modes in the basic computer along with an example. (don't skip)
7. List out and explain the data transfer and manipulation instructions.
8. Explain BSA, BSZ and ISZ instructions.

UNIT-III

1. Practice all number system conversions. (don't skip)
2. Explain the fixed-point representation. (Sign-magnitude, 1's complement and 2's complement)
3. Explain floating-point representation. (don't skip)
4. Draw and explain flow chart of addition and subtraction algorithm for sign-magnitude data.
5. Draw and explain the unsigned multiplication algorithm**. (Problems discussed in class)**
6. Booth's algorithm (Flow chart + problems discussed in class) **(don't skip)**
7. Restring and non-restoring division algorithms **(Only practice flow chart)**
8. Draw and explain the decimal BCD arithmetic circuit. (don't skip)

UNIT-IV

1. Explain the basic input and out peripherals used for the basic computer.
2. Explain the need for an input-output peripheral interface. **(Practice diagram)** (don't skip)
3. Draw and explain the asynchronous format.
4. Explain the modes of transfer in input and output organization.
5. Isolated I/O vs Memory-mapped I/O. (don't skip)
6. Programmed I/O vs Interrupt Driven I/O vs DMA. (don't skip)
7. With a neat diagram, explain the priority interrupt controller.
8. Explain DMA operation along with a diagram.
9. Explain each element in the memory hierarchy. (don't skip)
10. Draw and explain the chip configuration of RAM organization. (don't skip)
11. Differentiate between SRAM and DRAM.
12. Explain auxiliary memory organization.
13. Draw and explain the associative memory organization. (don't skip)
14. Draw and explain the chip configuration of ROM.
15. Explain cache mapping techniques. (don't skip)

UNIT-V

1. CISC vs RISC **(don't skip)**
2. Explain Flynn's classification of computers.
3. With a neat diagram, explain the 4-segment pipeline processing. (don't skip)
4. Explain the arithmetic pipeline. (**Practice flow chart**)
5. Explain instruction pipelining. (**Practice flow chart and space-time diagram)**
6. Explain array processors.
7. Explain the need for vector processing and its applications.
8. Explain the basic characteristics of multiprocessors.
9. Interconnection structure (Very Important- don't skip)
10. Explain the process of inter-processor communication and synchronization.
11. Discuss the problem of cache coherence and how to overcome this problem. (don't skip)