**Course: CS219-Computer Organization**

**Semester: Fall 2023**

**Study Guide for Midterm -2**

**Note: This Test-2 includes the content of Chapter 4 only. The topics given below are not limited for Test-2. Apart from below, material covered during in lectures, assignments, worksheets must be considered as prior.**

**However, give preference to the topics listed below first.**

**Questions breakdown-**

**Objective Questions**

**Short Questions – 1 to 2**

**Big Questions- 3 (multiple subsections)**

1. Objective Type Questions:
2. five basic components of a computer
3. Logic Design conventions- combinational, state
4. Control decision instructions- control signals for branch, jump, zero signal etc.
5. Clock cycles required in single, multi, and pipelining implementations
6. Datapath- Cycle Time/Critical Path (Based on the given Fig. 4.XX)-
7. Check Practice Sheets, Worksheets, Assignments related to Chapter 4
8. Write control signals for the given instruction.
9. Tracing/Highlight the Datapath for the given- R/I/J format instruction.
10. Critical path for the given- R/I/J format instruction.
11. Single, Multiple-Cycle, Pipelining
12. Check Practice Sheets, Worksheets, Assignments related to Chapter 4
13. Single cycle (non-pipelined processor)
14. Multiple cycle (non-pipelined processor)
15. Pipelined processor
16. Speed-up
17. Hazard Detection-
18. Check Practice Sheets, Worksheets, Assignments related to Chapter 4
19. Identify hazards from given instruction set like RAW, WAR, WAW. If the same type of hazard is repeating mark it as RAW1, RAW2, etc.
20. Calculate the number of cycles required, with no forwarding and use only nops to handle hazards.
21. Calculate the number of cycles required, with forwarding and use nops as necessary to handle hazards.
22. Rearrange Instructions to reduce stalls.