Capital University of Science and Technology

Department of Computer Science

CS 2523 – Computer Organization and Assembly Language

QUIZ NO. 1: Basics of Computer Organization and Assembly Language

Section# 4

CLO: 1. Define concepts in the design of microprocessor as state machine and designing its data path and its controller.

Semester: Fall 22 **Max Marks:** 10

Instructor: Ms. Tayyaba Zaheer **Date:** October 10, 2022 **Max Time:** 10 Minutes

Name: **Reg. No.**

Question No.1 [03 Marks]

Write the following in the correct order of 5 levels of programmer's view of a computer: [You can only write numbers in order like ii, iii, vi…]

i. Microarchitecture
ii. Application Programs High-Level Language
iii. Assembly Language
iv. Digital Logic
v. Instruction Set Architecture
vi. Operating System

Solution:

ii, iii, vi, v, i, iv
ii. Application Programs High-Level Language,
iii. Assembly Language,
vi. Operating System,
v. Instruction Set Architecture,
i. Microarchitecture
iv. Digital Logic

Question No. 2 [03 Marks]

Which of the following are the correct 3 Data Path Operations?

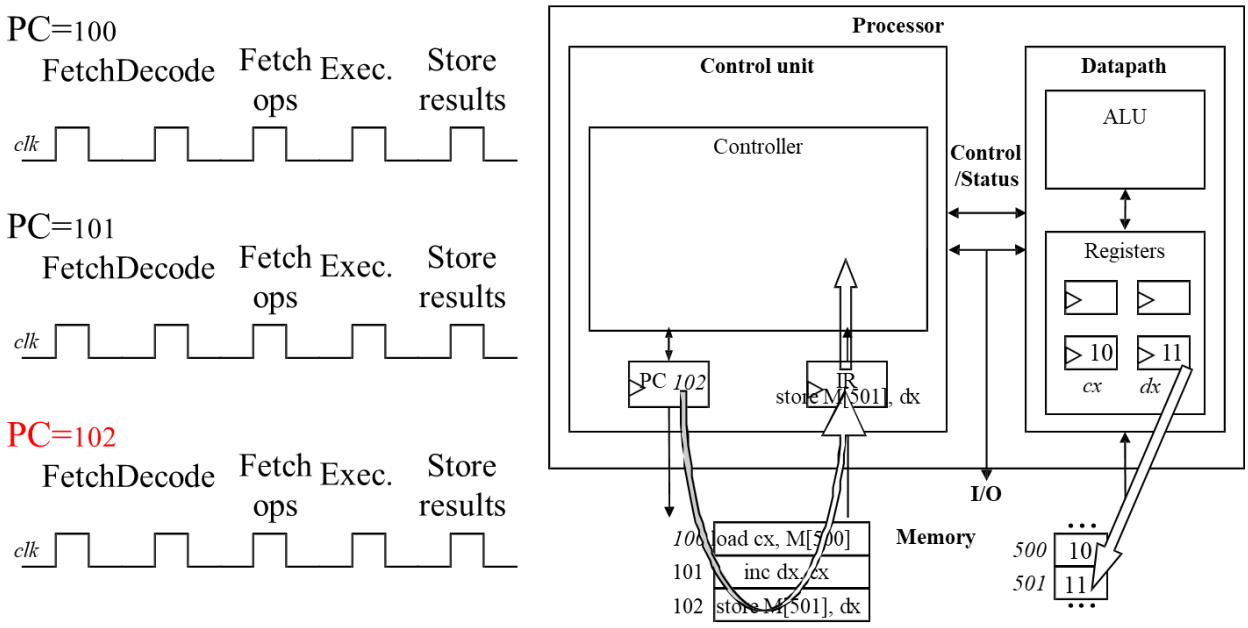
i. Fetch, Load, ALU.
ii. Load, ALU, Store.
iii. Load, Write, Store.

Solution:

ii

Question No. 3 [04 Marks]

Elaborate 5 sub-operations of the control unit in the given scenario of Instruction Cycle:



Solution:

1. **Fetch:** Instruction at address 102 would be fetched from memory. Because PC has address of the instruction i.e. 102.
2. **Decode:** Instruction would be decoded by the control unit as per the opcode i.e. load (opcode means load data from memory to register). Control unit would set the controls as per the opcode of the instruction.
3. **Fetch Operands:** This sub operation would not be executed for this particular instruction as memory reading is involved in the given instruction.
4. **Execute:** This sub operation would not be executed for this particular instruction as there is nothing to be executed by ALU.
5. **Store:** This sub operation would store back to memory in this instruction i.e. M[501] = 11