Assignment 4

Computer Architecture

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**Question 1:**

(A):

**RAW Dependency:**

1: MOV R3, R7

2: LD R8, (R3)

**WAR Dependency:**

3: ADD R3, R3

4: LOAD R9, (R3)

**WAW Dependency:**

4: LOAD R9, (R3)

5: BNE R8, R9, L3

(B):

Data dependency is a circumstance in which a program guideline alludes to the information of going before direction. So, in this condition without executing past guidelines, current train won't get the information or the genuine information esteem is reliant on past directions.

Data Hazard is the circumstance which keep the following guideline in the direction stream from executing in its assigned clock cycle. Information perils makes on the grounds that the guideline has information reliance from past direction cycle, and without accepting information from that it can't be execute in assigned execution cycle.

**Question 2:**

(A):

Bypass is done to dodge danger or rise in the pipeline cycle by bypassing the incentive to another guideline when accessible. Bypassing isn't conceivable to utilize every last time since some guideline may require to complete finish cycle and afterward no one but it can pass information to other cycle.

(B):

Without Bypassing:

LD R2 (R1) IF ID EX MEM WB

SUB R3, R2, RI IF stall ID EX MEM WB

With Bypassing:

LD R2 (R1) IF ID EX MEM WB

SUB R3, R2, RI IF ID stall EX MEM WB