Department of Computer Science / 2nd Year Bachelor   Name: ....

Module: Computer Architecture

Duration: 40 min / **Date:** January 2025   Group: ....

Quiz **(Answer on the sheet)** – **Choose only one exercise**

Exercise 1: We aim to compute the expression: **F = (A + B) × ((C − D) / E).**
Variables A, B, C, D, E, and F are initially in memory.

Question: Write the best equivalent assembly code for computing the above expression using Accumulator Architecture, Stack Architecture, and Register-Register Architecture.

Accumulator Architecture (temporary Variables: T_1, T_2, T_3)	Stack Architecture	Register-Register Architecture (Registres frome R_0 to R_9)

Exercise 2 :

	Using a 5-stage pipeline (Fetch, Decode, Read Register, Execute, Write-back):
1. **LW** r3, 0(r2) 2. **ADD** r5, r3, r4 3. **SUB** r6, r5, r7 4. **OR** r8, r6, r9 5. **SW** r8, 4(r2)	1. **Identify all data hazards and their type:** • Read After Write (RAW) • Write After Write (WAW) • Read After Read (RAR) 2. **Draw the execution diagram** 3. **Propose solutions to resolve or minimize hazards.**

Answers:

1. **Data Hazards**

Read After Write (RAW)	Write After Write (WAW)	Read After Read (RAR)
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2. **Execution Diagram**

	Cycles										
	1	2	3	4	5	6	7	8	9	10	11
Fetch											
decode											
R.reg											
Exec											
Write B.											

3. **Propose solutions to resolve or minimize hazards.**

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