



Faculty of Computers & Artificial Intelligence

2<sup>nd</sup> Term (2019-2020) Final Exam (تخلفات)

class: 3<sup>rd</sup> Year Students

Course Code: CHW 362

Course name: Computer Architecture & Organization



Benha University

Final Date: 7 / 6 / 2020

Total Marks: Pass / Fail

Examiner(s): Dr.Fatma Sakr

**Research submission: From 31 May to 7 June 2020**

a) **Write a research project in ONE of the following topics:**

### Topic No. 1

Parallel computing has become the dominant paradigm in computer architecture. It's gaining broader interest due to the physical constraints preventing frequency scaling. Describe the concepts of the following:

- 1- Types of parallelism
  - Bit-level parallelism
  - Instruction-level parallelism
  - Task parallelism
  - Superword level parallelism
- 2- Hardware used in each type of parallelism
  - I- Memory and communication
  - II- Classes of parallel computers
    - Multi-core computing
    - Symmetric multiprocessing
    - Distributed computing
    - Specialized parallel computers

### Topic No. 2

As computer industry grew bigger and bigger, computer manufacturers started competing and each one started to point out his product features.

Consider the following CPUs (Processors)

- I- RISC-V
- II- ARM cortex M3

Describe the architectures with consideration to:

- Instruction Set
- Datapath
- Control unit type
- Interfacing buses
- Internal buses
- Floating Point Unit

Explain and compare how these organizations address major bottlenecks that limit CPU execution speed, with a number of innovative techniques for improving CPU performance.

**b) Notes: please, your research must contain the following elements:**

- a. Research cover
- b. Research name
- c. Introduction
- d. Design (block diagrams, tables for Instruction Sets )
- e. Implementation ( Datapath , control unit, Memory.....)
- f. Result
- g. Conclusion
- h. References

**GOOD LUCK,**

**Examiner(s)**

**Head of Departement /  
Program Coordinator**