



**Faculty of Computers & Artificial Intelligence**  
**2<sup>nd</sup> Term (2019-2020) Final Exam**  
class: Medical Informatics Program    Level: 2<sup>nd</sup> level  
Course Code: MCS222  
Course name: Computer Architecture



**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**

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

### **Topic No. 1**

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- SAP-3

II- ARM 7

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.

### **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- Intel Atom Processor

II- Athlon

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.

## Topic No. 3

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

**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 Department /  
Program Coordinator**