



**Faculty of Computers & Artificial Intelligence**  
**2<sup>nd</sup> Term (2019-2020) Final Exam**  
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**

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.

### **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- Pentium 4

II- Ultrasparc IV

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**

Embedded systems are computing systems with tightly coupled hardware and software integration, that are designed to perform a dedicated function. To structure a program so that it runs more efficiently on a real machine you must understand what's going on in the lower level(CPU level) , For embedded systems architecture describe the following:

- Embedded Systems vs. General Purpose System
- Embedded System Architecture
  - Embedded Systems Hardware
  - Embedded Systems Software
- New Trends in Embedded Systems

**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
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**GOOD LUCK,**

**Examiner(s) :**

**Head of Departement /  
Assoc. Prof. Ahmed Elsayy**