Faculty of Computers & Artificial Intelligence   **Benha University**
2ⁿᵗ Term (2019-2020) Final Exam   **Final Date**: 7 / 6 /2020
Information Security and Digital Forensics Program   **Total Marks:** Pass / Fail
Course Code: FCS222   **Level:** 2nd level   **Examiner(s):** Dr Alaa eldin Abdallah
Course name: Computer Architecture

Research submission: From 31 May to 7 June 2020

a) <u>Write a research project in ONE of the following topics:</u>

Topic No. 1

Memory Performance Attacks – Memory hog- problem.
Assume you have multicore system – like AMD Barcelona- and you found Unexpected Slowdowns in your device. Figure out the problem, assuming that MATLAB and another application are running. And also fix the problem after you know the reason for this slowdown.

Topic No. 2

Today is a very exciting time to study computer architecture.
Today many difficult problems motivating and caused by the shift Power/energy constraints, through your understanding to computer architecture subject; discuss the need for studying computer architecture in universities and how the big organization like **Intel** and **AMD** apply the fundamentals of computer architecture to revolutionize the processor industry. Explain your discussion by case study.

Topic No. 3

Von Neumann model and dataflow model
Von Neumann and dataflow are two different models; which one is faster than other, and which model is commonly used today? Also show the key characteristics of the von Neumann model, and what difficulty does the dataflow model of computing at the ISA level pose to programmers? And How is this difficulty eliminated while still exploiting benefits of dataflow? Explain your answer through an example like factorial program, and mention the famous companies that used these models.

Topic No. 4

ISA elements and X86, alpha processors
Discuss ISA elements and explain how these elements in the two different processors X86 and alpha.

Topic No. 5

ISA tradeoffs
Assume you are the owner of hardware organization and want to release new version of processor to the market, explain the ISA tradeoffs that you will consider.

b) <u>**Notes: please, your research must contain the following elements:**</u>
- Level (ISA – Microarchitecture…)
- Real example
- References

GOOD LUCK,

Examiner(s)   **Program Coordinator**

Dr. Alaa eldin Abdallah   **Dr. Ahmed Taha**