

Student Name: _____

Student ID No: _____

SCHOOL OF COMPUTER SCIENCES
UNIVERSITI SAINS MALAYSIA

CST433 – Advanced Computer Organization & Architecture
Semester II, 2018/2019 Academic Session

28 March 2019 (Thursday), 12:00 pm – 1:00 pm

TEST 1

Instructions: Answer all questions in the papers provided. Do not forget to write your name on every sheet of your answer paper.

1. Discuss the following laws in relation to the evolution of computer microarchitecture: how these laws have influenced the development of the modern architecture, whether they are still relevant and why? (25/100)

(a) A scaling law known as Dennard Scaling

(b) Moore's Law

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c) Amdahl's Law

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2. Compare the following methods: pipelined caches, multi-bank caches and non-blocking caches.
[hints: for each optimization method, state the advantage and explain whether the method has impacted energy consumption and bandwidth, justify your answer]. (25/100)

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3. With relevant examples, compare basic dynamic scheduling (scoreboarding) with dynamic scheduling with renaming. What is the essence of dynamic scheduling? What are the challenges when implementing dynamic scheduling. (25/100)

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4. Considering the following mobile processors: Kirin 980, Snapdragon 855, A12 Bionic and Exynos 9820. Discuss the CPU cores supported, connectivity, GPU and AI capability as common features that these processors have. Also for each processor, elaborate **two** advanced technological features that make it distinct from the rest. Lastly, what is the future technological trend for mobile processors and why? (25/100)