Student Name: _____

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SCHOOL OF COMPUTER SCIENCES
UNIVERSITI SAINS MALAYSIA

CST433 – Advanced Computer Organization & Architecture
Semester II, 2020/2021 Academic Session

6 May 2021 (Thursday), 12:15 pm – 1:15 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. By using appropriate examples, compare and distinguish the following:

(a) Compare Dennard Scaling and Moore's Law. (Hints: 2 similarities and 2 differences) [20/100]

(b) Distinguish between computer architecture and microarchitecture. (Hints: 4 differences)[20/100]

2. With relevant examples, analyse and predict the technological trends in computer processor and computer memory based on past and the present trends. [Hints: highlight their impact to the development of modern computer architecture.]

(a) Analyse the past and present technological trends of computer processor and memory. [20/100]

(b) Based on the analysis you have made in (a) above, how do you predict the future technological trends for both processor and memory. [5/100]

(c) Discuss their impact (technological trends in processor and memory) to the development of the modern computer architecture. [5/100]

3. Pipelining is one of the core enablers in exploiting instruction-level parallelism (ILP).

(a) Show how pipelining benefits the instruction-level parallelism. [10/100]

(b) Identify and elaborate **three (3)** challenges of pipelining implementation. [15/100]

(c) List possible approaches that can address the challenges mentioned in (b) above. [5/100]