Student Name: _____

Student ID No: _____

SCHOOL OF COMPUTER SCIENCES

UNIVERSITI SAINS MALAYSIA

CST433 – Advanced Computer Organization & Architecture

Semester II, 2019/2020 Academic Session

16 April 2020 (Thursday), 12:10 pm – 1:10 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, distinguish different the functional requirements faced by the designers in designing the following computing systems. (36/100)

(a) Personal mobile device (6/100)

(b) General purpose desktop (6/100)

(c) Servers (6/100)

(d) Warehouse-scale computers (6/100)

(e) Internet of things (6/100)

(f) Embedded computing (6/100)

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2. Compare the following approaches in modern computer architecture: virtual memory, virtual machine and virtual machine monitor [Hints: for each, list and elaborate their 3 similarities and 3 differences]. Also, discuss their impact to the modern computer architecture. (36/100)

(a) Three similarities (9/100)
i.
ii.
iii.

(b) Three differences (18/100)

	Virtual memory	Virtual machine	Virtual machine monitor
i.			
ii.			
iii.			

(c) Their impact (9/100)
i. Virtual memory
ii. Virtual machine
iii. Virtual machine monitor

3. With relevant examples, compare two fundamental approaches to exploiting instruction-level parallelism (ILP). [Hint: name the two fundamental approaches and identify their three common goals. Also, compare their strengths and shortcomings). (28/100)

(a) Name the two approaches with an example for each approach (6/100)
i.
ii.

(b) Identify the three common goals of both approaches with an appropriate example for each goal
(6/100)
i.
ii.
iii.

(c) The strengths of each approach (8/100)

	The first approach name	The second approach name
i.		
ii.		

(d) The shortcomings of each approach (8/100)

	The first approach name	The second approach name
i.		
ii.		