Review Test Submission: Quiz 1 (9/3)

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Course	CSE661/CIS655 - Advanced Computer Architecture - F20
Test	Quiz 1 (9/3)
Started	9/2/20 12:58 AM
Submitted	9/2/20 1:38 AM
Due Date	9/3/20 11:59 PM
Status	Completed
Attempt Score	80 out of 100 points
Time Elapsed	39 minutes out of 2 hours
Results Displayed	All Answers, Submitted Answers, Correct Answers, Feedback, Incorrectly Answered Questions

Question 1

10 out of 10 points

A microprocessor clocked at the rate of 2 GHz has a clock cycle time of

Selected Answer: 0.5 ns

Answers:
2 ns
4 ns
0.5 ns
1 ns

Response Feedback: Correct!

Cycle time = 1/Frequency

Question 2

10 out of 10 points

Select the three basic building blocks of computers.

Selected Answers:
Computation
Communication
Storage

Answers:
Computation
Communication
Storage

Response Feedback: Correct!

Question 3

10 out of 10 points

RISC architectures are more suitable for portable electronic devices than CISC.

Selected Answer: True

Answers: True

False

Response Feedback: Correct!

RISC architectures usually have simpler design.

Question 4

10 out of 10 points

Given the importance of registers, what is the rate of increase in the number of registers in a chip over time?

Selected Answer: Very slow: Since programs are usually distributed in the language of the computer, there is inertia in instruction set architecture, and so the number of registers increases only as fast as new instruction sets become viable.

Answers:

Very fast: They increase as fast as Moore's Law, which predicts doubling the number of transistors on a chip every 18 months.

Very slow: Since programs are usually distributed in the language of the computer, there is inertia in instruction set architecture, and so the number of registers increases only as fast as new instruction sets become viable.

Response Feedback: Correct!

Question 5

0 out of 10 points

Processors with faster clock rates will always be faster?

Selected Answer: True

Answers: True

False

Response Feedback: Incorrect!

CPUtime = Number of instructions * CPI * Cycle Time

Clock rates only affect Cycle Time.

Question 6

10 out of 10 points

CPUtime = (Instructions / Program) x (Cycles / Instruction) x (Seconds / _____)

Selected Answer: Cycles

Correct Answer:

Evaluation Method	Correct Answer	Case Sensitivity
Contains	Cycle	

Response Feedback: Correct!

CPUtime = Number of instructions * CPI * Cycle Time

Number of instructions = Instructions / Program

CPI = Cycles / Instruction

Cycle Time = Seconds / Cycle

Question 7

0 out of 10 points

$$\text{"}Y \text{ is } p\% \text{ faster than } X\text{"} = \frac{\text{Time of } X}{\text{Time of } Y} = 1 + \frac{p}{100}$$

Selected Answer: False

Answers: True

False

Response Feedback: Incorrect!

The given equation is the definition of speedup.

Question 8

10 out of 10 points

A given application written in C runs 23 seconds on a desktop processor. A new C compiler is released that requires only 70 percent as many instructions as the old compiler. Unfortunately, it increases the CPI by 20 percent. How fast can we expect the application to run using this new compiler?

Selected Answer: 23×0.7×1.2 = 19.3 sec

Answers: 23×0.7×1.2 = 19.3 sec

(23x0.7)/1.2 = 13.4 sec

(23×1.2)/0.7 = 39.4 sec

Response Feedback: Correct!

CPUtime = Number of instructions * CPI * Cycle Time

New compiler's CPU time = (old number of instructions *0.7) * (old CPI * 1.2) * Cycle time

= Old compiler's CPU time * 0.7 * 1.2

Question 9

10 out of 10 points

For a given CPU and benchmark, CPU performance is indirectly proportional to the system clock frequency.

Selected Answer: False

Answers: True

False

Response Feedback: Correct!

CPUtime = Number of instructions * CPI * Cycle Time

= Number of instructions * CPI * (1/Frequency)

and, CPU performance = 1/CPUtime

Question 10

10 out of 10 points

Which speedup could be approximately achieved according to Amdahl's law for infinite number of processors if 20% of a program is sequential and the remaining part is ideally parallel?

Selected Answer: 5

Answers: Infinite speedup

1.2

5

20

Response Feedback: Correct!

Based on Amdahl's law,

Overall speedup = 1/((1-p)+(p/s)) = 1/(0.2+0.8/infinity) = 1/0.2 = 5

Thursday, October 8, 2020 7:24:57 AM EDT

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