



Performance

Student Solutions

Exercises Computer Architecture

1 | Processor Benchmark & Performance

1.1 Which of the following statements are correct?

Three statements are true one is false.

per/benchmark-01

1.2 What is the throughput?

One statement is true and three are false.

per/benchmark-02

1.3 What is the SPEC?

One statement is true and three are false.

per/benchmark-03

1.4 What is the goal of the EEMBC Benchmark?

One statement is correct and three are false

per/benchmark-04

1.5 Which of the following is an energy efficiency metric?

One statement is correct and three are false.

per/benchmark-05

1.6 Both power consumption and performance per watt matters for an embedded system.

50/50 change. Think.

per/benchmark-06

1.7 Processor performance

- a) $30\mu s$
- b) $2 \frac{\text{cycles}}{\text{instruction}}$
- c) $5 \frac{\text{cycles}}{\text{instruction}}$
- d) $292\mu s$



e) Processor B is 1.29 times faster than processor A.

per/performance-01

1.8 Processor performance

- a) $\text{CPI}_{\text{Avg.A}} = 3.775 \frac{\text{cycle}}{\text{instr}}$ & $\text{CPI}_{\text{Avg.A}} = 2.52 \frac{\text{cycle}}{\text{instr}}$
- b) Computer B is 1.35 times faster than Computer A.
- c) 2.69GHz

per/performance-02

1.9 Processor performance

Execution_time = 8.75ms

per/performance-03

1.10 Processor performance

Variant 2

per/performance-04

1.11 Processor performance

- a) CPU_A is better when
 - a) $w_{p_1} > 90.90\%$
 - b) $w_{p_2} < 9.09\%$
- b) CPU_B is better when
 - a) $w_{p_1} > 90\%$
 - b) $w_{p_2} < 10\%$
- c) CPU_C is better when
 - a) $w_{p_1} > 50\%$
 - b) $w_{p_2} < 50\%$

per/performance-05

1.12 Processor performance

CPU A is the fastest!

per/performance-06

1.13 Processor performance

The clock frequency of the CPU is 2 GHz
4.65

per/performance-07

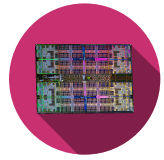
1.14 What is the best metric for comparinc performance?

One statement is true the others are false.

per/performance-08

1.15 Processor performance

$T = 3.2\bar{3}\text{ms}$



per/performance-09

1.16 Amdahl's Law

$$S = 5.263\%$$

per/amdahls-law-01

1.17 Amdahl's Law

$$f = 66.\bar{6}\%$$

per/amdahls-law-02

1.18 Amdahl's Law

Optimization A is 1.28 times better than Optimization B.

per/amdahls-law-03