

計算機結構 HW1

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1.15.

(a)  $0.5 \times 1 + 0.5 \times 10 = 5.5$  #

(b) 
$$\frac{5.5 \times 10 - 10}{5.5 \times 10 - 5.5} = \frac{45}{49.5} = 0.9090 = 90.90\%$$
 #

100 秒  $\rightarrow$  20 秒.

1.16.

(a) 
$$\text{Speed-up overall} = \frac{1}{(1 - 0.2) + \frac{0.2}{2}} = \frac{10}{9} \approx 1.11$$
 #

(b) 
$$\text{Speed-up overall} = \frac{1}{0.7 + \frac{0.2}{2} + 0.1 \times 1.5} = \frac{1}{0.95} \approx 1.05$$
 #

(c) ① execution time: 
$$\frac{\frac{0.2}{2}}{0.7 + \frac{0.2}{2} + 0.1 \times 1.5} = \frac{2}{19} \approx 10.5\%$$

② data cache: 
$$\frac{0.1 \times 1.5}{0.7 + \frac{0.2}{2} + 0.1 \times 1.5} = \frac{3}{19} \approx 15.8\%$$