Computer Architecture: answers to unassessed tutorial exercises

Exercise 6.1

(a)

$$\begin{aligned} \text{Number of page table entries} &= 2^{32}/2^{12} \\ &= 2^{20} \end{aligned}$$

(b)

$$\begin{aligned} \text{Size of page table} &= 2^{20} \times 2^{2}\text{bytes per page table entry} \\ &= 4MB \end{aligned}$$

Exercise 6.2

(a) Bookwork.

(b) Bookwork.

(c) For the set-associative cache:

$$\begin{aligned} \text{Total number of blocks} &= m \\ \text{Number of blocks in a set} &= n \\ \text{Number of sets} &= m/n \\ \text{Tag size} &= p - log\,(m/n) \end{aligned}$$

(d) For the direct-mapped cache:

$$\begin{aligned} \text{Tag size} &= p - log\, m - log\, n \\ &= \textit{p - log (m*n)} \end{aligned}$$