

7.10 Consider a 32-bit data bus SDRAM. Given that the clock frequency of the bus is 200MHz, what is the peak memory bandwidth in megabyte per second (MBs)? (5 pts)

$$\text{clock frequency} = 200 \text{ MHz}$$

$$\text{width of data bus} = 32 \text{ bits} \Rightarrow 8 \text{ bits} = 1 \text{ byte} \Rightarrow \frac{32}{8} = 4 \text{ bytes}$$

$$\text{Bandwidth} = \text{Bus width} \times \text{SRAM Frequency}$$

$$= 4 \times 200 \times 10^6$$

$$= 800 \text{ MBs}$$

7.11 Consider a 64-bit data bus SDRAM. Given that the clock frequency of the bus is 200MHz, what is the peak memory bandwidth in megabyte per second (MBs)? (5 pts)

$$\text{clock frequency} = 200 \text{ MHz}$$

$$\text{width of data bus} = 64 \text{ bits} \Rightarrow 8 \text{ bits} = 1 \text{ byte} \Rightarrow \frac{64}{8} = 8 \text{ bytes}$$

$$\text{Bandwidth} = \text{Bus width} \times \text{SRAM Frequency}$$

$$= 8 \times 200 \times 10^6$$

$$= 1,600 \text{ MBs}$$

7.12 Consider a 32-bit data bus DDR SDRAM. Given that the clock frequency of the bus is 200MHz, what is the peak memory bandwidth in megabyte per second (MBs)? (5 pts)

$$\text{clock frequency} = 200 \text{ MHz}$$

$$\text{width of data bus} = 32 \text{ bits} \Rightarrow 8 \text{ bits} = 1 \text{ byte} \Rightarrow \frac{32}{8} = 4 \text{ bytes}$$

$$\text{Bandwidth} = \text{Bus width} \times 2 \times \text{SRAM Frequency}$$

$$= 4 \times 2 \times 200 \times 10^6$$

$$= 1,600 \text{ MBs}$$