2.1.2.

What is the minimum bandwidth needed to get $B \frac{bits}{sec}$ using:

a) NRZ encoding

$B \frac{b}{s} \Rightarrow$ max $B \frac{transitions}{s} \Rightarrow$ max $\frac{B}{2} \frac{periods}{s} \Rightarrow$ ~~minimum~~ $\boxed{min \frac{B}{2} Hz \ bandwidth}$

b) Manchester encoding

$B \frac{b}{s} \Rightarrow$ max $2B \frac{transitions}{s} \Rightarrow$ max $B \frac{periods}{s} \Rightarrow \boxed{min \ B \ Hz \ bandwidth}$