INF5350

Obligatory exercises following lecture #4

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1. An HDTV camera delivers 720p50 video format. What is the frame time and the row time? You can assume 1280 pixels/row, a vertical blanking time (VB) of 80rows and horizontal blanking time (HB) of 80 pixels.
2. What is the pixel output rate of the above camera?
3. What is the frame time, row time, and pixel output frequency in case of a 1080p60 (ie 1920 pixels/row) camera with same HB and VB?
4. Same question for 60Hz 4K video where number of active pixels is 3840x2160, HB is 560pixels, and VB is 90rows.
5. Let the total load capacitance of a RST line of one pixel row be 3pF (incl routing and gate capacitance). What capacitance (CB) is required to boost RST to VDD+1V? Assume VDD=3V. Boost circuit explained on page-21 in lecture #4.
6. Simulate the above booster circuit using ideal switches and non-overlapping clocks