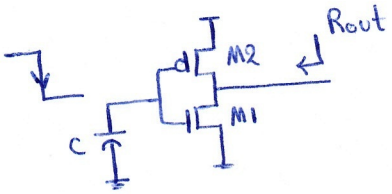
Based on hint:

1. Connecting a load of 100pf to the gate



$$I_{av} = \frac{1}{2}\left[I_{ds}(V_{out}=0) + I_{ds}(V_{out}=\frac{Vdd}{2})\right]$$

2. Calculating the LH propagation delay

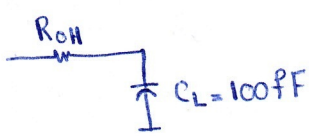
$V_{out}=0$ $\quad I_{ds} = \frac{k'_p}{2}\left(\frac{W}{L}\right)_p\left[V_{gs}-|V_{tp}|^2\right](1+\lambda V_{ds}) = 802\mu A$

$V_{out}=\frac{Vdd}{2}$ $\quad I_{ds} = \frac{k'_p}{2}\left(\frac{W}{L}\right)_p\left[2(V_{gs}-|V_{tp}|)\frac{Vdd}{2} - \frac{Vdd^2}{2_1}\right] = 555\mu A$

$\Rightarrow I_{av} = 678.5\mu A$

$$t_{pd} = \frac{C_L \frac{Vdd}{2}}{I_{av}} = \frac{(100fF)(\frac{1.5}{2}V)}{678.5\mu A} = 11.05\ ns$$

3. Equating propagation delay to a simple RC network



$$t_{pLH} = 0.7\ R_{OH}\cdot C_L \longrightarrow R_{OH} = \frac{t_{pLH}}{0.7\,C_L} = \frac{11.05\ ns}{0.7(100\,pF)} \longrightarrow R_{OH} = 1571\,\Omega$$

Based on Elmore technique:

$$\begin{aligned}\tau = {} & (1.579k\Omega + 120\Omega)\,75\,fF \\ & + (1.579k\Omega + 120\Omega)(15fF + 45fF + 50fF) \\ & + (1.579k\Omega + 120\Omega + 165\Omega)\,100\,fF \\ & + (1.579k\Omega + 120\Omega + 165\Omega)\,95\,fF \\ & + (1.579k\Omega + 120\Omega + 165\Omega + 105\Omega)\,65\,fF \\ & + (1.579k\Omega + 120\Omega + 165\Omega + 105\Omega + 220\Omega)\,200\,fF\end{aligned}$$

$$\longrightarrow \quad \tau = 1.24\ ns$$

$$t_{pLH} = 0.7\tau = 0.7 * 1.24ns = 871\ ps$$