OPHW2-5 Soln)

a)
The condition for a bright reflection is
$PC_{TOP} + PC_{BOTTOM} + 2\ n_2\ d = m\lambda_o$ (m a positive integer, λ_o the wavelength in vacuum)
We're given that $n_1 = 1$ (air) and then $n_2 = 1.45$ and $n_3 = 1.33$, so $PC_{TOP} = 180^o$ and $PC_{BOTTOM} = 0^o$.
$\lambda_o/2 + 0 + 2\ n_2\ d = m\lambda_o$
$2\ n_2\ d = (m + {}^1/_2)\lambda_o$
$\lambda_o = 2\ n_2\ d/(m + {}^1/_2) = 2*1.45*380/(m + {}^1/_2) = 1102/(m + {}^1/_2) = 2204$ nm (m = 0), 735 nm (m = 1), **441 nm** (m = 2), 315 nm (m = 3)
of which 735 nm might be visible and 441 nm would be visible.
b)
The condition for a bright transmission is the same as for a dark reflection:
$PC_{TOP} + PC_{BOTTOM} + 2\ n_2\ d = (m + {}^1/_2)\lambda_o$ (m a positive integer, λ_o the wavelength in vacuum)
or, after doing the manipulation:
$\lambda_o = 2\ n_2\ d/m = 2*1.45*380/m = 1102/m = 1102$ nm (m = 1), **551 nm** (m = 2), 367 nm (m = 3)