

Question #62851 - Economics – Macroeconomics | Completed

Question

A Company is operating on perfectly competitive markets and wants to maximize its profits. Assume that HSG uses the production function $Y = AL^\alpha$ with $A = 2$ and $\alpha = 0.5$. The real wage w is 4. What is the optimal value of labor L that should be employed?

Answer

On our perfect competitive market profit is equal to:

$\pi = p \cdot Y - w \cdot L$, profit is maximum when $\pi' = 0 \Rightarrow$

$\Rightarrow p \cdot (dY/dL) - w = 0 \Rightarrow p \cdot (d(AL^\alpha)/dL) - w = 0 \Rightarrow p - w = 0$

With linear production function ($Y = AL^\alpha$) – the higher price the more profit company gets, if $p < 4$ the company has negative net profit.

If assume that there's mistake in question and production function is $Y = AL^\alpha$, then

$\pi' = 0 \Rightarrow p \cdot (dY/dL) - w = 0 \Rightarrow p \cdot (d(AL^\alpha)/dL) - w = 0 \Rightarrow p \cdot (A \cdot \alpha \cdot L^{\alpha-1}) - w = p/L^{0.5} - 4 = 0 \Rightarrow$

$\Rightarrow L = p^2/16$