

Answers for HW assignment 5

/1/  $3.04 \times 10^{-10} \text{ T}$  [2 pts]

/2/ Derive the equations [4 pts]

/3/ Derive the equations [4 pts]

/4/ Show that  $\nabla \cdot \mathbf{S} = -\partial u / \partial t - \mathbf{E} \cdot \mathbf{J}_{\text{free}}$  [2 pts]

/5/ Given the equations for  $\mathbf{E}(\mathbf{x}, t)$  and  $\mathbf{B}(\mathbf{x}, t)$ , verify that Maxwell's equations are satisfied. [2 pts]

/6/ First take the real part, i.e., write the real fields  $E$  and  $B$ ;  
then show  $\nabla \cdot \mathbf{S} = -\partial u / \partial t = -2\omega\epsilon_0 E_0^2 \sin(kz - \omega t) \cos(kz - \omega t)$   
[2 pts]

/7/  $B_0 = 1.67 \times 10^{-11} \text{ T}$ ;  $I = 3.32 \times 10^{-8} \text{ W/m}^2$   
[4 pts]