Modern Optics, Quiz 1

SN:_____, Name:_____

1. In a two-beam interference situation, suppose the electric field of the ith beam is $\vec{E}_i(r,t) = E_{0i}\cos(\vec{k}_i \cdot \vec{r} - \omega t + \varepsilon_i)$, where i =1, 2 in our case. Derive the interference intensity for cases, (1) E_1 is parallel to E_2, (2) E_1 is perpendicular to E_2. Define any needed parameters if it is not given in the problem.

2. What is the Fourier transform of (1) a delta function, (2) a square function? You can assume the parameters you need. Note: a typical square function have value of unity in a certain range, say a≤ x ≤ b.