Group Discussion

1. True or False: An electromagnetic wave is created by a charged particle moving through space at a constant velocity.

Work Problems

2. Find the direction of propagation for figures 1 and 2 and the direction of the B field in figure 3.

3. A radio station broadcasts at a frequency of 830 kHz. At a point some distance from the transmitter, the magnetic-field amplitude of the transmitted electromagnetic wave is $4.82 \times 10^{-11} \, \text{T}$. Calculate (a) the wavelength; (b) the wave number; (c) the angular frequency; (d) the electric field amplitude at that same point (and same time).
A 75 Watt incandescent light bulb can be modeled as a sphere with a 6 cm diameter. Typically, only about 5% of the energy goes to visible light; the rest goes largely to nonvisible infrared radiation. (a) What is the visible light intensity (in W/m^2) at the surface of the bulb? (b) What are the amplitudes of the electric and magnetic fields at this surface, for a sinusoidal wave with this intensity?

5.

An intense light source radiates uniformly in all directions. At a distance of 5.0 m from the source, the radiation pressure on a perfectly absorbing surface is 9.0*10^{-6} Pa. What is the total average power output of the source?