

Physics 1214, Homework #7 (due 10/24)

- M1 Light having a certain frequency, wavelength, and speed is traveling through empty space. If the frequency of the light were doubled, then
- A. its wavelength would remain the same, but its speed would double.
 - B. its wavelength would remain the same, but its speed would be halved.
 - C. its wavelength would be halved, but its speed would double.
 - D. its wavelength would be halved, but its speed would remain the same.
- M2 If a sinusoidal electromagnetic wave with intensity 10 W/m^2 has an electric field of amplitude E , then a 20 W/m^2 wave of the same wavelength will have an electric field of amplitude
- A. $4E$.
 - B. $2\sqrt{2}E$.
 - C. $2E$.
 - D. $\sqrt{2}E$.

Problems

- P1 The voltage across a 300 pF parallel-plate capacitor changes at the rate of 10 V/s. What is the magnitude of the induced magnetic field at 10 cm radially outward from the center of the capacitor?
- P2 A high-energy pulsed laser with a beam diameter of 1 mm emits a 1 ns long pulse of average power 1×10^{11} W. Determine (a) the energy delivered in each pulse, and (b) the rms value of the electric field.