Physics 2321. E&M, Sound & Light

Final Exam. Name:_____

Light, optics, waves and sound

Constants:

$\epsilon_0 = 8.85 \times 10^{-12} F/m$	$\mu_0 = 1.26 \times 10^{-6} T \cdot m/A$	$e = 1.6 \times 10^{-19}$ C	
$k = 9 \times 10^9 Nm^2/C$	$m_e = 9.11 \times 10^{-31}$ kg	$n_{water} = 1.33$	$n_{air} = 1.00$

Assorted equations:

$y(x,t) = A\sin(kx - \omega t + \phi)$	$y(x,t) = f(x - vt)$ *or* $f(x + vt)$	$v = \lambda f$
$v = \sqrt{\frac{T}{\mu}}$	$v = \sqrt{\frac{B}{\rho}}$	$v = 331 m/s\sqrt{1 + T_C/273}$
$E_\lambda = \frac{1}{2}\mu\omega^2 A^2 \lambda$	$P = \frac{1}{2}\mu\omega^2 A^2 v$	$s(x,t) = s_{max}\cos(kx - \omega t)$
$I = \frac{P_{avg}}{4\pi r^2}$	$\beta = 10\log(\frac{I}{I_0})$	$\Delta P(x,t) = \Delta P_{max}\sin(kx - \omega t)$
$q = -\frac{n_2}{n_1}p$	$\frac{1}{p} + \frac{1}{q} = \frac{1}{f}$	$M = -\frac{q}{p}$