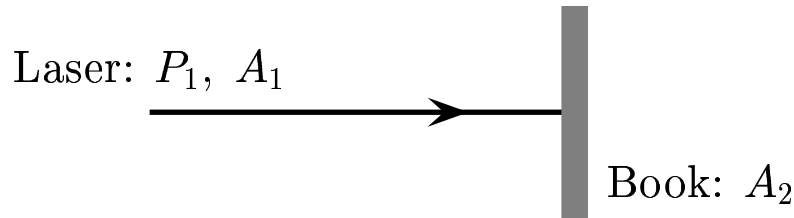


A laser beam has a cross section A_1 and a power P_1 .



Find the maximum electric field, E_{max} of the laser beam. Assume the area of the book is $A_2 = 1000A_1$ and $\frac{3}{4}$ of the light is reflected by the book.

- A) $E_{max} = \sqrt{\frac{2c\mu_0 P_1}{A_1}}$
- B) $E_{max} = \sqrt{\frac{2c\mu_0 P_1}{A_2}}$
- C) $E_{max} = \sqrt{\frac{c\mu_0 P_1}{A_1}}$
- D) $E_{max} = \sqrt{\frac{c\mu_0 P_1}{A_2}}$

Recall: $\vec{S} = \frac{1}{\mu_0} \vec{E} \times \vec{B}$; $E = cB$; $I = S_{av} = c u_{av} = \frac{\text{power}}{A}$;

Therefore $\frac{P_1}{A_1} = S_{av} = \frac{1}{2\mu_0} E_{max} B_{max} = \frac{E_{max}^2}{2c\mu_0}$.

Solving for E_{max} , we have $E_{max} = \sqrt{\frac{2c\mu_0 P_1}{A_1}}$.

Answer **A**.

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