

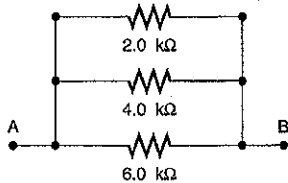
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**Physics 103 Quiz #12, Thursday (4/25/2013)**

Show all work in order to obtain points for problems

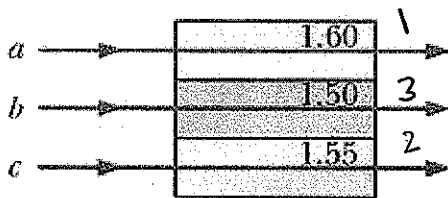
Name: \_\_\_\_\_

1. (2 pts.) What is the equivalent resistance of the set of resistors?



$$R_{eq} = \frac{1}{\frac{1}{2000} + \frac{1}{4000} + \frac{1}{6000}} = 1.09 \text{ k}\Omega$$

2. (2 pts.) Three pulses of light—a, b, and c—of the same wavelength are sent through layers of plastic whose indexes of refraction are given. Rank the pulses according to their travel time through the plastic, greatest first.



$$v = c/n \rightarrow \text{long time} \Rightarrow \text{small } v$$

$$\text{long time} \Rightarrow \text{large } n$$

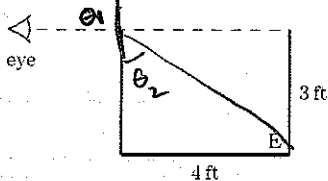
(a) a, b, c

(b) a, c, b

(c) b, c, a

(c) c, b, a

3. (3 pts) The rectangular metal tank shown is filled with an unknown liquid. The observer, whose eye is level with the top of the tank, can just see corner E. What is the index of refraction of the liquid?



$$\theta_1 = 90^\circ, n_1 = 1.00$$

$$n_1 \sin \theta_1 = n_2 \sin \theta_2 \rightarrow n_2 = \frac{n_1 \sin \theta_1}{\sin \theta_2}$$

$$\sin \theta_2 = \frac{4}{\sqrt{3^2 + 4^2}} = \frac{4}{5}$$

$$n_2 = \frac{1}{\frac{4}{5}} = \frac{5}{4} = 1.25$$