1 | **Problem 3**

$$
\begin{aligned}
n &= \frac{c}{v} \\
1.33 &= \frac{c}{v} \\
1.33v &= c \\
v &= \frac{1}{1.33}c \\
v &\approx 0.7502c \\
v &\approx 0.7052 * 299792458 \text{ m/s} \\
v &\approx 211413641.3816 \text{ m/s}
\end{aligned}
$$

2 | **Problem 4**

$$
\begin{aligned}
n_1 &= n_{\text{air}} = 1.0003 \\
n_2 &= n_{\text{diamond}} = 2.42 \\
\theta_1 &= 30^\circ
\end{aligned}
$$

2.1 | **Angle of Refraction**

$$
\begin{aligned}
n_1 \sin\theta_1 &= n_2 \sin\theta_2 \\
\frac{n_1 \sin\theta_1}{n_2} &= \theta_2 \\
\frac{1.0003 \sin 30^\circ}{2.42} &= \theta_2 \\
\frac{1.0003 * 0.5}{2.42} &= \theta_2 \\
0.2067^\circ &\approx \theta_2
\end{aligned}
$$

2.2 | **Speed of Light in Medium**

$$
\begin{aligned}
n_2 &= \frac{c}{v} \\
n_2 v &= c \\
v &= \frac{c}{n_2} \\
v &= \frac{c}{2.42} \\
v &\approx \frac{299792458}{2.42}\ \text{m/s} \\
v &\approx 123881181\ \text{m/s}
\end{aligned}
$$

3 | **Problem 5**

$$
\begin{aligned}
n_1 &= 1.52 \\
n_2 &= 1.33 \\
\theta_2 &= 90^\circ \\
n_1 \sin\theta_1 &= n_2 \sin\theta_2 \\
n_1 &= \frac{n_2 \sin\theta_2}{n_1} \\
n_1 &= \frac{1.52 \sin 90^\circ}{1.33} \\
n_1 &= \frac{1.52}{1.33} \\
n_1 &\approx 1.143^\circ
\end{aligned}
$$

4 | **Problem 7**

D. It is said to be *dispersive*.