1 | **Problem 3**

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

2 | **Problem 4**

$$n_1 = n_\text{air} = 1.0003$$
$$n_2 = n_\text{diamond} = 2.42$$
$$\theta_1 = 30°$$

2.1 | **Angle of Refraction**

$$n_1 \sin \theta_1 = n_2 \sin \theta_2$$
$$\frac{n_1 \sin \theta_1}{n_2} = \theta_2$$
$$\frac{1.0003 \sin 30°}{2.42} = \theta_2$$
$$\frac{1.0003 * 0.5}{2.42} = \theta_2$$
$$0.2067° \approx \theta_2$$

2.2 | **Speed of Light in Medium**

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

3 | **Problem 5**

$$n_1 = 1.52$$
$$n_2 = 1.33$$
$$\theta_2 = 90°$$
$$n_1 \sin\theta_1 = n_2 \sin\theta_2$$
$$n_1 = \frac{n_2 \sin\theta_2}{n_1}$$
$$n_1 = \frac{1.52 \sin 90°}{1.33}$$
$$n_1 = \frac{1.52}{1.33}$$
$$n_1 \approx 1.143°$$

4 | **Problem 7**

D. It is said to be *dispersive*.