Name: _____ Class: _____ Date: _____ ID: A

Ch17 Review

17.1 Conceptual Questions

____ 1) A light beam has speed c in vacuum and speed v in a certain plastic. The index of refraction n of this plastic is
A) $n = cv$. B) $n = (v/c)^2$. C) $n = v/c$. D) $n = c/v$. E) $n = (c/v)^2$.

____ 2) If the index of refraction of a material is 2, this means that light travels
A) 2 times as fast in air as it does in vacuum. B) 2 times as fast in the material as it does in air. C) 2 times as fast in vacuum as it does in the material. D) 2 times as fast in the material than it does in vacuum. E) 1/2 as fast in air as it does in the material.

____ 3) Light enters air from water. The angle of refraction will be
A) greater than the angle of incidence. B) equal to the angle of incidence. C) less than the angle of incidence.

____ 4) Which of the following terms describe lenses that are thicker at the center than at the edges? (There could be more than one correct choice.)
A) converging lenses B) diverging lenses C) concave lenses D) convex lenses

____ 5) A convex lens has focal length f. If an object is placed at a distance of $2f$ from the lens on the principal axis, the image is located at a distance from the lens
A) of $2f$. B) between f and $2f$. C) of f. D) between the lens and f. E) of infinity.

____ 6) If a object is placed between a convex lens and its focal point, the image formed is
A) virtual and upright. B) virtual and inverted. C) real and upright. D) real and inverted.

____ 7) Is it possible to see a virtual image?
A) No, since the rays that seem to emanate from a virtual image do not in fact emanate from the image. B) No, since virtual images do not really exist. C) Yes because the rays that appear to come from a virtual image can be focused by the eye just like those from an object. D) Yes, but only by using an additional lens to form a real image before the light reaches the eye.

____ 8) Light goes from material having a refractive index of $n1$ into a material with refractive index $n2$. If the refracted light is bent away from the normal, what can you conclude about the indices of refraction?
A) $n1 > n2$ B) $n1 \geq n2$ C) $n1 < n2$ D) $n1 \leq n2$ E) $n1 = n2$

____ 9) A convex lens has focal length f. If an object is located at "infinity" (very far away), the image formed is located at a distance from the lens
A) of $2f$. B) between f and $2f$. C) of f. D) between the lens and f. E) of infinity.

____ 10) What type of lens is used to make a magnifying glass?
A) converging B) diverging C) Either type would work equally well.

____ 11) A beam of light traveling in air strikes a glass slab at an angle of incidence less than 90°. After entering the glass slab, what does the beam of light do? (There could be more than one correct choice.)
A) I follows the same path as before it struck the glass. B) It follows the normal to the glass slab. C) It bends away from the normal at the point of contact. D) It bends closer to the normal at the point of contact. E) It slows down.

17.2 Problems

____ 12) The speed of light in a certain material is measured to be 2.2×10^8 m/s. What is the index of refraction of this material? ($c = 3.0 \times 10^8$ m/s)
A) 1.1 B) 1.2 C) 1.4 D) 1.6 E) 1.8

____ 13) A beam of light, traveling in air, strikes a plate of transparent material at an angle of incidence of 56.0°. It is observed that the reflected and refracted beams form an angle of 90.0°. What is the index of refraction of this material?
A) 1.40 B) 1.43 C) 1.44 D) 1.48

____ 14) Light having a speed in vacuum of 3.0×10^8 m/s enters a liquid of refractive index 2.0. In this liquid, its speed will be
A) 6.0×10^8 m/s B) 3.0×10^8 m/s C) 1.5×10^8 m/s D) 0.75×10^8 m/s E) 0.67×10^8 m/s

____ 15) A beam of light traveling in air strikes a slab of transparent material. The incident beam makes an angle of 40° with the normal, and the refracted beam make an angle of 26° with the normal. What is the speed of light in the transparent material? ($c = 3.0 \times 10^8$ m/s)
A) 1.0×10^8 m/s B) 2.0×10^8 m/s C) 2.3×10^8 m/s D) 3.0×10^8 m/s E) 0.50×10^8 m/s

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Answer Section

1)	ANS:	D	PTS: 1	REF:	Var: 1
2)	ANS:	C	PTS: 1	REF:	Var: 1
3)	ANS:	A	PTS: 1	REF:	Var: 1
4)	ANS:	A, D	PTS: 1	REF:	Var: 1
5)	ANS:	A	PTS: 1	REF:	Var: 1
6)	ANS:	A	PTS: 1	REF:	Var: 1
7)	ANS:	C	PTS: 1	REF:	Var: 1
8)	ANS:	A	PTS: 1	REF:	Var: 1
9)	ANS:	C	PTS: 1	REF:	Var: 1
10)	ANS:	A	PTS: 1	REF:	Var: 1
11)	ANS:	D, E	PTS: 1	REF:	Var: 1
12)	ANS:	C	PTS: 1	REF:	Var: 1
13)	ANS:	D	PTS: 1	REF:	Var: 1
14)	ANS:	C	PTS: 1	REF:	Var: 1
15)	ANS:	B	PTS: 1	REF:	Var: 1