

## Physics 180B Test 3

Date: Friday Nov. 7<sup>th</sup> 2008 time 8:30 am (**update 2**)

### Chapter 23 - ElectroMagnetic Waves

#### ElectroMagnetic waves

- What is Light? What are the two processes that create ElectroMagnetic Waves?
- How do we know light travels in waves?
- What is the significance of equation 23.2?
- How is Cerenkov radiation produced?
- Why do astronomers use different parts of the electromagnetic spectrum to view objects in space (figure 23.4)?
- Where do gamma rays, x-rays, visible light rays, and radio waves originate?
- Radiation pressure (page 771, equation  $I/c$ )?
- h. How was the Big Bang Theory developed? Expansion, Doppler Effect, COBE?**
- i. How do we know what we know about the beginning of the universe and it's subsequent evolution?**

Example: 5

MC Questions: 1, 6, 9

Basic Problems: 1, 3, 5, 6, 9a, 10a, 11, 12, 20

Medium Problems: Radiation Pressure (25, 72, 73)

#### Reflection and Refraction

- What is specular and diffuse reflection?
- What is the index of refraction?
- How do we use Snell's Law to find the refracted light ray through any medium?
- What is Total Internal Reflection?
- Why is the sky blue?

Figures: 15, 16, 17, 18, 19, 22, 25, 26, 27

Examples: 6, 7

MC Questions: 7, 8, 11, 12, 13

Basic Problems: 32, 33, 34, 39, 43, 44, 45, 46

Medium Problems: 50, 80, 81

## Chapter 24 - Geometric Optics

- Show how an image is seen from the perspective of a viewer. Figure 24.3
- What is the Blind Spot when driving?
- How did bulging pieces of glass allow us to change our worldview?

### Reflection from Spherical Convex and Concave Mirrors

- Know these figures; 24.11, 12, 15, 16, 19, 20
- Know these equations; 24.6, 24.7
- Problem solving strategy 21.1
- The **three principal rays** needed to find the image. (**Converging and Diverging**)

Examples: 1, 2, 3

MC Questions: 6

Basic Problems: 5, 6, 8, 9, 13, 14, 15, 16, 17

Medium Problems: 60

### Reflection from Spherical Convex and Concave Thin Lenses

- Know these figures 24.27, 28, 30, 36, 37
- Know these equations 24.17, 18
- Know Converging and Diverging lenses.
- Problem solving strategy 24.2
- The **three principal rays** needed to find the image.

Examples: 9, 10

MC Questions: 1, 2, 3, 4, 7, 9, 10, 11,

Basic Problems: 29, 30, 31, 49, 50, 51, 52, 53, 54, 55, 56

Medium Problems: 32, 33, 34, 35, 36, 45, 46, 47, 64

## Chapter 36 - Interference and Diffraction

- Young's Double Slit Experiment** and Interference (**Constructive and Destructive**)
- Diffraction (pages 873-875)
- X-Ray Diffraction (pages 882-884)
- Holography (pages 888-890)

Figure: 26.1, 3, 4, 16, 17, 30, 31, 34, 40

Examples: 1, 2

Equation: 26.1, 2, 3, 4, 5, 6

MC Questions: 1, 2, 5,

Basic Problems: 1, 2, 3, 6, 7, 8,

Medium Problems: 4, 5, 14, 54, 71