**Semester Review Questions**

1. Define specular and diffuse reflection. Be able to recognize both.

2. A clown is rocking on a chair in the dark. His glowing red nose moves back and forth a distance of 0.42 m exactly 30 times a minute, in a simple harmonic motion. A) What is the amplitude of this motion? B) What is the period of this motion? C) What is the frequency?

3. A 5.00 kg. block hung on a spring causes a 10.0 cm elongation of the spring. A) what is the restoring force exerted on the block by the spring? B) What is the spring constant? C) What force is required to stretch this spring 8.5cm horizontally? D) What will the spring’s elongation be when pulled by a force of 77.7 N?

4. A child swings on a playground swing with a 2.5 m long chain. A) What is the period of the child’s motion? B) What is the frequency of the vibration?

5. If a pendulum was set to keep time and then brought to the moon (gravity is 1/6th of Earth), what property would you have to change to make sure it kept the same accurate time?

6. Know the wave equation and all its iterations.

7. One foggy morning, Kenny is driving his speed boat toward Brant Point lighthouse at a speed of 15.0m/s as the fog horn blows with a frequency of 180.0 Hz. What frequency does Kenny hear as he moves?

8. Zeke plucks a C on his guitar string, which vibrates with a fundamental frequency of 261 Hz. The wave travels down the string with a speed of 400 m/s. What is the length of the guitar string? B) Would Zeke need longer or shorter strings to play the fundamental frequency for higher notes?12`

9. Find the wavelength of the ultrasonic wave emitted by a bat if it has a frequency of 4.0 X 10^4 Hz.

10. Be able to define each of the following terms:

- ultrasonic

- supersonic

- infrasonic

- sonic boom

11. Be able to identify virtual and real images and how they are formed.

12. You will not draw ray diagrams but you do need to be able to recognize correct and incorrect diagrams.

13. What is the magnification equation? How is it used?

14. Name each part of wave.

15. Sadie looks at her friend’s face through a diverging lens. A) is the image real or virtual? B) If her friends face is 50.00 cm from the lens that forms an image at a distance of 20.00 cm, what is the focal length of the lens? C) Draw a ray diagram of the situation.

16. Know the light and pigment color wheels.

17. Know each type of wave interference.

- diffraction

- Doppler

- polarization

- reflection

- refraction

18. What is the illuminance of an object that is 1.5 m away from a light source with a luminous flux of 780 lumens?

19. What is total internal reflection?

20. Remember the rainbow video? Where do rainbows occur?

21. Know the following terms:

- pitch

- timbre

- loudness

- decibels

22. What does “n” represent in Snell’s Law?

23. Given n(i) of 1.00 and n(r) of 1.33 and an angle of 45 degrees calculate the angle of refraction for the material.