

Name: \_\_\_\_\_

# Optics Unit Test Practice

## SNC2D

Part 1: Multiple Choice (13 marks, 1 mark each)

- Which of the following types of electromagnetic waves travels fastest in a vacuum?  
A. microwaves  
B. visible light  
C. x-rays  
D. They all travel at the same speed.
- If the wavelength of visible light is changed, the \_\_\_\_\_ of the light will change.  
A. brightness  
B. colour  
C. speed  
D. all of the above
- A light ray travelling through air meets a boundary with glass. The light ray travels \_\_\_\_\_ in the glass.  
A. faster  
B. more slowly  
C. at the same speed  
D. It cannot be determined
- If the light ray in Question 3 makes an angle with the glass, the light ray is refracted:  
A. toward the normal with the boundary  
B. away from the normal with the boundary  
C. at an equal angle with the normal to the boundary  
D. It cannot be determined.
- A ray is incident on a plane mirror at an angle of  $25^\circ$  from the normal. The angle of reflection is \_\_\_\_\_ from the normal.  
A. less than  $25^\circ$   
B. greater than  $25^\circ$   
C. equal to  $25^\circ$   
D. It cannot be determined.
- The image formed in a plane mirror is always:  
A. real and upright  
B. real and inverted  
C. virtual and upright  
D. virtual and inverted
- The image formed in a convex mirror is always:  
A. real and larger  
B. real and smaller  
C. virtual and larger  
D. virtual and smaller
- An object is positioned at the focal point of a converging lens. The image will be:  
A. the same size and real  
B. the same size and virtual  
C. larger and virtual  
D. There is no image formed.
- Hyperopia or farsightedness of the eye occurs when an image is in focus at a position behind the retina. Hyperopia is corrected by lenses that are:  
A. converging  
B. diverging  
C. either converging or diverging  
D. neither converging nor diverging

10. Most of the refraction of the eye occurs in the:
- A. cornea                      B. crystalline lens      C. pupil                      D. retina
11. An object that reflects all colours of light will appear:
- A. black                      B. colourless              C. opaque                      D. white
12. Dispersion can occur when white light is:
- A. absorbed                      B. reflected                      C. refracted                      D. all of the above
13. Light produced by an object at a high temperature is called:
- A. chemiluminescent      B. fluorescent              B. incandescent              D. triboluminescent

Part 2: Short Answer and Diagrams (4 marks each)

1. Sketch what happens when light rays parallel to the principal axis strike a (a) plate glass window; (b) converging lens; (c) diverging lens. Which can form a real image?
2. Sketch the eye and label the cornea, crystalline lens, retina, and iris.

3. An object is placed 6.0 cm from a converging lens with a focal length of 2.0 cm. Sketch a ray diagram to locate the image and describe the characteristics of the image.

Part 3: GUSS Solutions (5 marks each)

1. (a) What is the frequency of a light ray of wavelength  $650 \times 10^{-9} \text{ m}$ ? (2 marks)
- (b) If the ray is incident on a transparent surface at an angle of  $36^\circ$  and the angle of refraction within the material is  $25^\circ$ , find the refractive index of the material. (3 marks)
2. An object of height 3.0 cm is placed 8.0 cm from a converging lens of focal length 6.0 cm. Find (a) the location and (b) the height of the image.