Multiple Choice (1 point each)

_1. Which of the following is NOT correct for a simple magnifying glass?
   A) the image is virtual   B) the image is erect
   C) the object is inside the focal point   D) the lens is diverging

_2. Waves from two slits are in phase at the slits and travel to a distant screen to produce the second
   side maximum of the interference pattern. The difference in the distance traveled by the waves is:
   A) half a wavelength   B) a wavelength
   C) three halves of a wavelength   D) two wavelengths

_3. Waves from two slits are in phase at the slits and travel to a distant screen to produce the second
   minimum of the interference pattern. The difference in the distance traveled by the wave is:
   A) half a wavelength   B) a wavelength
   C) three halves of a wavelength   D) two wavelengths

_4. When light travels from a larger index of refraction towards a smaller index of refraction, there is no phase
   change upon reflection at the boundary.
   A) true   B) false   C) it depends

_5. A 500 nm light is reflected constructively from a thin layer of oil of index of refraction 1.25 which is at the
   top of water of index of refraction 1.33. What is the minimum thickness (t) of the layer of oil?
   A) t = (500nm)/(2x1.25)   B) t = (500nm)/(2x1.33)
   C) t = (500nm)/(4x1.25)   D) t = (500nm)/(4x1.33)

Problem (5 points)
Two sources emit waves that are coherent, in phase, and have wavelengths of 25.0 m. Do the waves interfere
constructively or destructively at an observation point 40.0 m from one source and 127.5 m from the other source?

40.0 m/25.0 m = 1.6 wavelengths
127.5 m/25.0 m = 5.1 wavelengths

Since the path difference is 5.1 - 1.6 = 3.5 wavelengths, the waves interfere **destructively**
at the observation point.