

### Light Multiple Choice Concept Questions

- 1) Waves diffract most when going through a slit when the wavelength is  
a) large and the slit is large    b) large and the slit is small    c) small and the slit is large    d) small and the slit is small
- 2) You can hear people around a corner but you can't see them because light waves  
a) do not diffract    b) travel much faster than sound    c) are much shorter than sound    d) are much longer than sound
- 3) You can improve resolution by  
a) reducing wavelength, reducing object size    b) increasing wavelength, reducing object size  
c) reducing wavelength, increasing object size    d) increasing wavelength, increasing object size
- 4) Two candle flames don't show a two point interference pattern because they are  
a) out of phase, not bright enough    b) too far apart, not bright enough    c) too far apart, out of phase    d) all three
- 5) You can increase the number of nodal lines made by two sources by increasing the  
a) distance to screen    b) wavelength    c) separation    d) all three
- 6) Increasing the number of slits will increase the  
a) separation of nodes, size of nodes    b) separation of nodes, brightness of maxima    c) size of nodes, brightness of maxima
- 7) To see emission lines clearly we need them to be very bright and widely separated. For this reason spectroscopes must have gratings with slits that are very  
a) close together, very numerous    b) thin, very numerous    c) thin, very close together    d) all three
- 8) You have a polarizing filter. It will reduce unpolarized light by  
a) 75%    b) 50%    c) 25%    d) it depends
- 9) You place a second polarizing filter after the first one. It will further reduce the light by  
a) 75%    b) 50%    c) 25%    d) it depends
- 10) You have two polarizing filters lined up the same way. You can reduce the light passing through these filters to nothing by rotating  
a) one by  $45^\circ$     b) one by  $180^\circ$     c) one by  $45^\circ$  and the other by  $-45^\circ$     d) one by  $30^\circ$  and the other by  $-30^\circ$
- 11) You have two polarizing filters that are lined up so they block all the light. You can increase the light that gets through by  
a) placing a third filter in front of the first    b) placing a third filter after the second  
c) placing a third filter in between the two    d) a third filter won't transmit more light
- 12) Light can be polarized by  
a) scattering, filters    b) reflection, filters    c) reflection, scattering    d) all three
- 13) The polarization of light shows that light is made of  
a) waves    b) longitudinal waves    c) transverse waves    d) electromagnetic radiation
- 14) Polarization of light is used in  
a) sunglasses, photography    b) stress-strain analysis, sunglasses    c) stress-strain analysis, photography    d) all three
- 15) Waves are different from objects because waves  
a) travel at a set speed, can be in the same place at the same time    b) can pass through each other, travel at a set speed  
c) can pass through each other, can be in the same place at the same time    d) all three
- 16) Thin film interference is caused by interference after  
a) reflection, refraction,    b) reflection, , diffraction    c), refraction, diffraction    d) all three
- 17) Light refracts when it goes from air to water. This is because which of the following get smaller?  
a) wavelength, speed    b) wavelength, frequency    c) speed, frequency    d) all three
- 18) The colours in white light can be separated by  
a) reflection, thin film interference, refraction    b) reflection, refraction, diffraction  
c) reflection, thin film interference, diffraction    d) thin film interference, refraction, diffraction

- 19) The areas of constructive interference for light are called  
 a) maxima, bright fringes      b) antinodes, bright fringes      c) antinodes, maxima      d) all three
- 20) You can see interference of light around you every day in  
 a) oil films, prisms      b) CD's, prisms      c) CD's, oil films      d) all three



Use the pattern above to answer the next five questions.

- 21) The pattern that looks most like a double slit pattern is      A      B      C      D
- 22) The pattern made by squeezing two pencils together is      A      B      C      D
- 23) The pattern made by a diffraction grating is      A      B      C      D
- 24) The pattern made by a CD is      A      B      C      D
- 25) The patterns above were made with yellow light. If blue light were used the patterns would be  
 a) more spread out      b) less spread out      c) fainter      d) brighter