

**CONCEPT ORGANIZER 3B - CHAP. 3 (optical components, sections 3-3 to 3-5)**

Concept	Reading	Short Answer or Equation
<b>Modulators</b>	T44-45, Fig, 3-14, 3-15	
Q. Does a mechanical or an electro-optic modulator allow one to “chop” light at 1 MHz?		
<b>Beam Splitters</b>	T56-59, Fig 3-31	
Define the term beam splitter		
<b>Fiber Optics</b>	T59-60, Fig. 3-32	
Q. Will the collection angle of a fiber optic increase or decrease if the refractive index difference between the core and cladding increases?		
<b>Mirrors</b> - objective and image distances, solid angle of collection	T48-50, S5	
<b>Lenses</b> - objective and image distances, $F/n$ , solid angle of collection	T51-54, S5	
Q. Compare two mirrors (or lenses) of the same focal length but where one mirror has twice the diameter of the other. For the larger mirror, by what factor do the image distance, $F/n$ , and solid angle of collection change relative to the smaller mirror? Assume the mirrors are used for 1:1 focusing.		

<b>Optical Aberrations</b>	T55	
Q. What type of aberration is a lens subject to but not a front surface mirror?		
Q. Does the focal length depend on the wavelength for mirrors or for lenses?		
Q. A more curved mirror or lens (smaller R) has a longer or shorter focal length?		
<b>Optical Filters</b> bandpass and cutoff absorption interference filter	T60-T62	.
Q. In general, does an absorption band filter or interference filter have a narrower half-width?		
<b>Multiple Slit Diffraction</b>	T38-39	see concept organizer 3B
<b>Diffraction Gratings</b> grating equation blaze wavelength angular dispersion order free spectral range	T64-66, S6	
Q. If the groove density is doubled, the angular dispersion is 1/3, 1/2, the same, two times, or three times what it was originally? Answer the same question for the free spectral range change.		

CH 660

<p>Q. The free spectral range increases or decreases for higher orders?</p>		
<p>Q. The blaze wavelength depends on which of the following: groove spacing, groove angle, angle of incidence?</p>		
<p>Q. The angular dispersion in the third order is <math>1/3</math>, <math>1/2</math>, the same, two times, or three times of that is in the first order?</p>		
<p>From the Ocean Optics WEB site (see links on course WEB page), which gratings (out of 1 to 12) would you choose for high efficiency at 750 nm?</p>		