

## Chapter 5: Optics

1. What are the dual natures of lights?
2. Write the relationship relating to velocity, wavelength and frequency of light. What is the velocity of light?
3. Fill in the blanks shown in Table 5.1.

RF Band	Range		Use
VLF			
LF			
MF			
HF			
VHF			
UHF			
SHF			

**Table 5.1: Electromagnetic Spectrum**

4. Draw and briefly explain mirror, specular and diffuse reflections on surfaces.
5. Draw and show the equation related to Snell's Law.
6. If a light ray in air with a refractive index of 1 is incident upon a piece of glass with refractive index of  $n=1.5$  at an angle  $25^\circ$ , calculate the angle of refracted ray.
7. Draw a concave and convex lens to show where the focal point and focal lengths are. Indicate where their lens power is.
8. Draw and show the relationship between an object, image and focal length by a convex and by a concave lens.
9. Find the distance of the image from the centre of the concave lens if the focal point is 4cm and the object is 6 cm from centre of the lens.
10. An object of height 5 cm is placed 25 cm in front of a bi-convex lens with a focal length of 10 cm. What is the height of the image?
11. What is the main difference between mono and stereo visions ?
12. List the advantages and disadvantages of optical fibre system.
13. Draw the fibre optic distribution system and explain the function of each hub or node.

14. Draw 3 diagrams to explain reflection, critical angle and total internal reflection in a fibre optic system. Indicate all equations involved. Fibre Optics works on the principle of total internal reflection.
15. Find the critical angle when two media being glass and water. Given that the refractive index of glass and water is 1.5 and 1.33 respectively