

PIC Course
Assignment -1

1. Integrated optics is based on light propagation in
 - a. Optical Fibers
 - b. Optical Waveguides
 - c. In free space
 - d. Biomaterials
2. For single mode operation V-number of a symmetric slab waveguide has to be
 - a. Zero
 - b. Infinity
 - c. Less than pi
 - d. Less than 2.404
3. A channel waveguide's field confinement is
 - a. in depth direction only
 - b. in both width and depth
 - c. along propagation direction
 - d. width direction only
4. The field inside the guiding region of an asymmetric waveguide is represented by
 - a. sum of cos and sine functions
 - b. cos function only
 - c. sine function only
 - d. product of cos and sine functions.
5. The following effect can be used to control integrated optical devices based on glass
 - a. Electro-optic effect
 - b. Magneto-optic effect
 - c. Acousto-optic effect
 - d. Thermo-optic effect
6. The following is not a passive integrated optic device
 - a. Y-branch
 - b. Directional coupler
 - c. Modulator
 - d. Polarizer
7. The v number of a symmetric slab waveguide is 10. The number of modes it supports is
 - a. Ten
 - b. Zero
 - c. Four
 - d. Three
8. The normalized refractive index of a symmetric slab waveguide with $b= 0.5$ is
 - a. $(n_1+n_2)/2$
 - b. $(n_1-n_2)/2$
 - c. $\text{Sqrt}(n_1^2+n_2^2)/2$
 - d. $\text{Sqrt}(n_1^2-n_2^2)/2$

9. For guided mode of a slab waveguide, the following condition is required ($n_1 > n_2$)
- a. $k_0 n_2 < \beta < k_0 n_1$
 - b. $\beta < k_0 n_2$
 - c. $\beta > k_0 n_1$
 - d. $k_0 n_2 < \beta$ & $\beta > k_0 n_1$
10. A tapered optical waveguide is characterised by refractive index varying along
- a. Depth
 - b. Width
 - c. Propagation direction