Note: All questions are compulsory. Carrying mobile phone during examinations will be treated as a case of unfair means.

1. With the help of suitable diagram explain Optical Communication System. **[2 Marks] [CO-1]**

2. A step index fiber has a numerical aperture of 0.17 and a cladding refractive index of 1.46. Determine (i) the acceptance angle of the fiber when it is placed in water (refractive index of water may be taken as 1.33) (ii) the critical angle at the core-cladding interface. **[2 Marks] [CO-1]**

3. What is multipath time dispersion and material dispersion? How can these be minimized? **[2 Marks] [CO-2]**

4. Define mode, propagation constant, radiation mode and acceptance angle in context to optical waveguide. **[2 Marks] [CO-1]**

5. With the help of suitable diagram explain the ray propagation in planar optical waveguide. **[3 Marks] [CO-2]**

6. Starting from Maxwell's equations, derive the TE and TM mode equations. **[4 Marks] [CO-2]**

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