



**Optical communication (610535)3**

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**Exam: First**

**Prerequisite :Communication II**

**Engineering Faculty**

**Electrical & communication Dept.**

**Date : 10/4/2002**

**Time : one Hour**

**Question 1:**

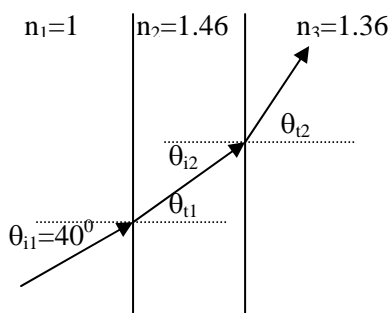
a- Sketch the Generalized Fiber Optic Communication System (10)

b- Give the meaning of (16)

- Optic Oscillators
- Incident Ray
- GRIN
- Material Dispersion
- Allowable Pulse Spread
- Reflection Coefficient
- Brewster Angle
- Critical Angle

**Question 2:**

a- Determine  $\theta_{i2}, \theta_{t1}, \theta_{t2}$  (15)



b- Consider a Gaussian Beam whose Spot size  $w=1$  mm when Collimated. The  $\lambda=0.82 \mu\text{m}$ . Compute the Divergence Angle. Also Find the Spot Size at 10m, 1 km and 10 km. (14)

**Question 3:**

a-Give the Equations for:( 9)

- Electric Field with Attenuation
- Focal Length
- Magnification

b-For an Air-to-Glass Interface, Compute the Refractive Index of the Coating Required yield Zero Reflection.(15)

**Question 4:**

A Parallel-Polarized Ray is Incident at an Angle of  $85^\circ$  when traveling from a medium of Index 1.465. the Wavelength is 1300nm

a-Compute the Reflection Coefficient

b-At what Distance from the boundary (in transmission Medium) does the electric Field Decay to 10% at its Value at the Boundary.(21)

