



Optical communication (610535)3

Instructor: Dr. Abdel-Rahman Al-Qawasmi

Semester: 2nd 2002/2003

Exam: First

Prerequisite :Communication II

Engineering Faculty

Electrical & communication Dept.

Date : 27/4/2003

Time : one Hour

Question 1:

Find the number of photons incident on a detector in 1 ns if the optic power 2 μm and the wavelength is 0.8 μm . ($h=6.626 \cdot 10^{-34}$ j x s, $C=3 \cdot 10^8$ m/s). (3 marks)

Question 2:

For an Air-to-Glass Interface, Compute the Refractive Index of the Coating Required yield Zero Reflection. (2 marks)

Question 3:

a- Give the Equations for(3 marks)

- Electric Field with Attenuation
- Focal Length
- Magnification

b- A light ray proceeds from air ($n_1=1$) into glass ($n_2=1.46$). Find the transmission angle when $\Theta_i=16^\circ$. (3 marks)

Question 4:

In Graded Index lens:

- Sketch and explain Coupling of light using these lenses. (2 marks)
- Show that, we can not get Brewster angle in perpendicular Polarization. (3 marks)

Question 5:

For an air-to-glass interface, compute the refractive index of the coating required yield zero reflection. Next, assume the coating material that has refractive index 1.38, compute the fractional amount of light reflected and the coating thickness if the illuminating-light wavelength is 0.8 μm . (the refractive index of glass=1.46).(4 marks)