Optical communication (610535)3

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Semester: **2nd 2002/2003**

Exam: **Second**

Prerequisite: Communication II

Engineering Faculty

Electrical & communication Dept.

Date : **15/5/2003**

Time: 60 minutes

Question 1(3 marks)

Sketch and explain the work of Fiber drawing and coating system

Question 2:(4 marks)

a- what is the maximum core radius allowed for:

1- SI fiber having n1=1.465 and n2=1.46 if the waveguide is to support only one mode at wavelength 1.3 micrometer.

2- GRIN fiber having a parabolic profile with the same parameters in (1).

b- Explain the results from 1 and 2.

c- What is the GRIN effective refractive index?

Question 3:(5 marks)

a- Show that the 3-dB modulation bandwidth of LED=$1/(2\pi\tau)$.

b- Explain the effect of carrier life time and rise time on LED.

c- Give three basic differences between LED and LD.

Question 4:(4 marks)

a- Write and explain the two possible ways to reduce the effect of temperature on light sources.

b- Compute the quantum efficiency of a detector having responsivity 0.007 A/W at wavelength 0.8 micrometer. Determine the voltage across 50-ohms load resistor when the optic power absorbed the detector is 2 microwatts.

Question 5:(4 marks)

Sketch and explain the work of semiconductor photodiode and compare it with the external photo diodes.

$(e =1.6.10^{-19} , h=6.63.10^{-34}, c=3.10^{8})$