Philadelphia University
Faculty of Engineering
Lecturer: Dr. Abdel-Rahman Al-Qawasmi
Coordinator:
Internal Examiner:

اسم الطالب:

الرقم الجامعي:

Examination Paper

Department of Communications & Electronics
Optical Communications (650535)
Second Exam. Section 1
Time: 50 min

Information for Candidates
Exam consists of 4 questions (20 marks, each question 5 mark).
Advice to Candidates
Answer all questions

Question1

a- Compute the Rayleigh scattering loss in a fiber system if the light wavelength 0.82 micrometer and the length of fiber equal 2 Km.
b- Calculate the numerical Aperture and fractional refractive index of a step index fiber if the core refractive index n_1=1.48 and cladding n_2=1.46.

Question2

a- Write three of the types of strengthening and protection needed for optic fiber cables.
b- Compute the number of modes in step index fiber whose core diameter is 55 micrometers. Assume that n_1 and n_2 as in Question 1 (b).

Question3

a- why laser diodes and light –emitting diodes are the most common sources in optical communication systems.
b- Compute the gap energy (eV) in LED that operates at wavelength 1 micrometer.

Question4

Show that the maximum value of spot size for single-mode propagation is ≈1.64 times larger for GRIN fibers than for SI fibers if n_1=1.0137n_2.

Objectives:

- Question 1 is about the attenuation in optical fibers
- Question2 is about the modes in different types of fibers and the types pf optic fiber cables.
- Question3 represent the light sources as modulators in optical communications systems.
- Question 4 shows the different in spot sizes for SI and GRIN fibers if the fractional refractive indices are the same.