

Roll No

EC-7003 (CBGS)**B.E. VII Semester**

Examination, November 2018

Choice Based Grading System (CBGS)**Optical Communication***Time : Three Hours**Maximum Marks : 70***Note:** i) Attempt any five questions.

ii) All questions carry equal marks.

iii) Assume suitable data, if required.

1. a) What are differences between a step index and graded index fiber?
b) An optical fiber has a NA of 0.2 and a cladding refractive index of 1.59. Determine the acceptance angle for the fiber in water which has a refractive index of 1.33.
2. a) What is Normalized frequency? Give its expression.
b) Calculate the numerical aperture of step index fiber having $n_1=1.48$ and $n_2=1.46$. What is the maximum entrance angle $Q_0(\max)$ for this fiber if the outer medium is air with $n=1$? Also derive the expression used.
<https://www.rgpvonline.com>
3. a) Explain the scattering and bending losses that occur in optical fiber with suitable diagram.
b) Discuss various splicing techniques in optical fiber.

4. a) Discuss the link power budget and rise time budget in detail.
b) What is the Resonant frequency of LASER? Derive the expression of wavelength spacing between two modes.
<https://www.rgpvonline.com>
5. a) How is Modulation of LASER diode done? Explain with a suitable diagram.
b) Explain the different optical fiber connectors used.
6. a) How is eye pattern useful in analyzing the performance of optical transmission?
b) A given silicon quantum efficiency of 65% at a wavelength of 900nm. Suppose $0.50\mu\text{W}$ of optical power produces a multiplied photocurrent of $10\mu\text{A}$. Find the multiplication factor. <https://www.rgpvonline.com>
7. a) Explain the operating principle of WDM. Write down some applications of WDM.
b) Discuss about the MEMS technology. How does it beneficial for WDM? Explain.
8. Write short notes (any four) :
 - i) EDFA
 - ii) Optical SNR
 - iii) Bending loss calculations
 - iv) Single mode fibers
 - v) Avalanche photodiodes
 - vi) Analog receivers
