Dronacharya Group of Institutions, Greater Noida

Electronics and Communication Engineering Department

Question Bank

Subject: OC (EEC-701) **Branch: ECE 7th Semester**

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1) Draw a block diagram of fiber optic communication system and describe the function of each component
2) What is the structure of optical fiber? Give the advantage of optical fiber over metallic cables.
3) Differentiate between step index and Graded index fiber. How the rays do propagates in graded index fiber?
4) What is the difference between acceptance angle, critical angle and numerical aperture? A step index fiber has a core and cladding refractive index of 1.50 and 1.46 resp. what is the value of NA and acceptance angle of the fiber?
5) Differentiate between Meridional Rays and Skew Rays. Explain the nature of light.
6) What is the group velocity and phase velocity? An optical signal of wavelength λ propagates in a medium of refractive e index n_1. What is the value of phase velocity and Group velocity?
7) Explain the following:
   a) Normalized propagation constant
   b) Mode field Theory
8) Explain what is meant by critical bending radius for an optical fiber.
9) Discuss the linear scattering losses in optical fibers w.r.t
   1) Rayleigh Scattering
   2) Mie Scattering
10) What do you mean by mode coupling? Explain the various irregularities in the fiber of its causes.
11) Explain Modal birefringence and beat length in single mode fibers,
12) Explain intrinsic and extrinsic absorption in optical fiber material.
13) Write a note on polarization maintaing fiber.
14) Explain the dispersion mechanism in optical fibers.
15) What is the population Inversion? Explain the mechanism of Population inversion for three level & four level energy state system.
16) What is the requirement for optical sources to feed into a fiber? Enlist the advantage & Disadvantages of LASER & LED.
17) Explain the necessity of carrier confinement in semiconductor laser.
18) Differentiate the different geometries of LASER
19) Explain the various structure of LED.
20) Derive the expression for the threshold value of gain for LASER oscillations.
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22) Explain the characteristics of LED.
23) Explain the principal of LASER diode. What are the pumping techniques of LASER diode? Give the structure of FP cavity LASER and how it is better than FP LASER.
24) What do you understand by the term external quantum efficiency and internal quantum efficiency?
25) What do you understand by optical detector? Discuss its various types of optical detector and parameters of photo detectors
26) Discuss the impact ionization in avalanche photodiode. Explain the multiplication factor and photo multiplication factors also.
27) Explain the various measures of efficiency in PIN photodiode & briefly explain the working principle of Schottky barrier photodiodes.

28) Explain the working of p-i-n photodiode. Also explain the factors that limit the speed of response of photodiode.

29) How is RAPD operated? How does it differ from p-i-n photodiode? What are the advantage & disadvantage of RAPD photo detector?

30) Mention the criteria for choosing the photo detectors for optical communication. How does a reverse bias p-n diode act as a detector?