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Total number of printed pages – 2

B. Tech  
CPEN 5304 (Old)

**Sixth Semester (Back) Examination – 2013**

**FIBER OPTIC INSTRUMENTATION**

**BRANCH : ICE, IEE**

**QUESTION CODE : B351**

**Full Marks – 70**

**Time : 3 Hours**

*Answer Question No. 1 which is compulsory and any **five** from the rest.  
The figures in the right-hand margin indicate marks.*

1. Answer the following questions :

2×10

- Define “Candela”.
- What is meant by monochromatic light ?
- Write few properties of LASER.
- Draw equivalent circuit of a p-n photo detector.
- What is refractive index of a material ?
- Write few materials used for making optical fibers.
- Write mathematical expression of Numerical Aperture.
- What is meant by mono mode fiber ?
- Why light is called as electro-magnetic wave ?
- What are the applications of distributed fiber optic sensor ?



P.T.O.

2. (a) Briefly explain structure and operation of LEDs. 5  
(b) Briefly explain principle of production of LASER. 5
3. (a) Describe structure and operation of APD photo diodes. 5  
(b) What are the sources of noise in optical detector ? Draw noise equivalent circuit and explain the importance of each component. 5
4. (a) Describe ray propagations in Step-Index fibers and Graded-Index fibers. 5  
(b) Briefly explain Absorption, Scattering and Bending losses in optical fibers. 5
5. (a) With suitable diagram, explain optical power launching schemes from Source-to-Fiber. 5  
(b) Explain principle of measurement using Phase Modulated sensors. 5
6. (a) Describe construction and working of fiber optic Gyroscope. 5  
(b) Describe principle of operation of any ONE optical amplifier. 5
7. (a) Describe principle of modulation of Intensity by Transmission medium in fiber optic measurement. 5  
(b) Briefly explain construction and working of Two Wave system Interferometer. 5
8. Answer any **two** from the following : 5×2  
(a) Working of p-n junction photo diode.  
(b) Lensing scheme for coupling improvement  
(c) Equilibrium Numerical Aperture.

