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A – 3848

Reg. No. :

Name :

**Seventh Semester B.Tech. Degree Examination, June 2016
(2008 Scheme)**

08.702 : OPTICAL COMMUNICATION (T)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions. **Each** carries 4 marks.

1. Define quantum efficiency and responsivity of a photodetector.
2. What are the noises in EDFA ?
3. What are solitons ?
4. What are the different types of fiber cables ?
5. Explain briefly about the non-linear effects in optical fibers.
6. List the demerits of soliton based communication system.
7. Find the percentage of optical power injected to a step index fiber from an LED. The v -parameter of the fiber is 2.4 and radius of the core $a = 5 \mu\text{m}$ operating at 1300 nm.
8. What are the advantages of DFB laser and tunable laser ?
9. What is meant by Amplified Spontaneous Emission (ASE) ?
10. Briefly explain about bending losses in fibers.



PART – B

Answer **any two** questions from **each** Module. **All** questions carry **equal** marks.

Module – I

11. Explain the chemical vapour deposition process of fiber fabrication with suitable diagram.
12. a) Explain the principle and working of DFB laser.
b) A graded index fiber has a core with a parabolic refractive index profile which has a diameter of $50 \mu\text{m}$. The fiber has a numerical aperture of 0.2. Estimate the total no. of guided modes propagating in the fiber when it is operating at a wavelength of $1 \mu\text{m}$.

P.T.O.



13. a) What are the different sources of noise in photodetectors ?
- b) Derive the expression for numerical aperture. Show that the light injected to a fiber from an LED is given by $(NA)^2 \times$ light radiated by an LED.

Module – II

14. Explain the principle and working of EDFA and also explain how the signal gain of EDFA vary with Erbium doped fiber length.
15. Explain the working of PSK heterodyne detection system and derive an expression for BER.
16. Explain the working principle of OTDR. Discuss how the technique may be used to take field measurements on optical fibers.

Module – III

17. Draw the structure of soliton link and explain the different problems in soliton system using lumped EDFA repeaters.
 18. Explain briefly.
 - a) Soliton lasers
 - b) Add/Drop Multiplexers (ADM).
 19. Explain the architecture of WDM with block diagram and discuss the challenges in DWDM.
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