# ANNA UNIVERSITY OF TECHNOLOGY, COIMBATORE

## B.E. / B.TECH. DEGREE EXAMINATIONS : NOV / DEC 2010

## REGULATIONS : 2007

## SEVENTH SEMESTER - ECE

### 070290088 - OPTICAL FIBER COMMUNICATION

Time : 3 Hours                                    Max. Marks: 100

## PART - A

**(20 x 2 = 40 Marks)**

### ANSWER ALL QUESTIONS

1. Define: V-number

2. A single mode fiber has a beat length of 8cm at 1300nm. Find modal bi-refringence.

3. Write short notes on: Total internal reflection.

4. Define: Mode field diameter (MFD).

5. Define fiber loss or attenuation.

6. Mention the factors that cause Scattering losses.

7. What do you mean by Polarization Mode Dispersion (PMD)?

8. What do you mean by inter-modal dispersion?

9. Compare the features of LED & Laser.

10. What is meant by population inversion?

11. What is coupling efficiency?

12. Give the expression for total optical power emitted from an LED.

13. What is excess noise factor?

14. Define: Quantum limit.

15. What are the benefits of a trans-impedance amplifier?

16. On what factors the response time of a photo detector depends?

17. Mention the key features of WDM?

18. What is a soliton?

19. What are the steps can be taken to avoid modal noise?

20. List the key requirements needed in analyzing a link.

1

## PART – B

**(5 x 12 = 60 Marks)**

### ANSWER ANY FIVE QUESTIONS

21. Explain in detail about the fiber types, modes and its configurations.

22. Discuss in detail about intra-modal dispersion with relevant expressions and diagrams.

23. Explain the different lensing schemes available to improve the Power Coupling efficiency.

24. Explain the construction & working of PIN photo detector in detail.

25. With necessary equations, explain in detail about Rise – time Budget analysis.

26. Draw and explain the LED structures based double Hetero structure configurations.

27. With the help of suitable diagram explain about SONET / SDH.

28. Derive the expression for probability of error($P_e$) in a Digital Receiver, with necessary diagrams.

### *****THE END*****