

B.TECH. DEGREE EXAMINATION, May 2014

Eighth Semester

Branch – Electrical and Electronics Engineering

EE 010 804 L06 - OPTOELECTRONICS

Time: Three Hours

Maximum: 100 Marks

Answer *all* questions

Part A

Answer *all* questions briefly

Each question carries 3 marks.

1. Define the term 'V' number.
2. What is meant by injection efficiency?
3. What are the advantages of APD?
4. What is meant by inter symbol interference?
5. What are optical logic gates?

(5 x 3 = 15 marks)

Part B

Answer *all* questions

Each question carries 5 marks

6. What are the adverse effects of signal degradation in optical fibre system?
7. Explain the characteristics of LEDs and describe the effect of temperature on them.
8. Explain the response and noise characteristics of PIN diode.
9. What is meant by equalisation and sensitivity in case of fibre optic receivers?
10. Explain on optical computing concepts

(5 x 5 = 25 marks)

Part C

Answer *any one* question from each module

Each question carries 12 marks

Module I

11. Explain in detail about different modes of propagation in an OFC. Give the phase and group velocities for each mode.

Or

12. With necessary equations explain the different losses in OFC.

Module II

13. Write short notes on
 - a. Direct and indirect band gap materials

- b. Hetero junction LEDs
- c. LASER diodes

Or

14. Explain in detail about LED as an optical source for OFC. Give its efficiency and problems associated.

Module III

15. Write short notes on
- a. Photo diodes
 - b. APD
 - c. Photo transistors

Or

16. What are fibre joints? With the help of neat diagrams, give the process of link design for OFC communication.

Module IV

17. a. Explain about speckle noise and reflection noise. Also, explain the problems associated with them.
b. Explain about amplifier design of receiver section for OFC.

Or

18. Explain in detail about eye diagram. What is its use? How can it be used for link design?

Module V

19. Write short notes on
- a. Raman amplifier
 - b. Erbium doped optical amplifier

Or

20. What is meant by WDM? With the help of a neat block diagram, explain the concept and components used in WDM.

(5 x 12 = 60 marks)