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Question Paper Code : 80327

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Seventh Semester

Electronics and Communication Engineering

EC 6016 — OPTO ELECTRONIC DEVICES

(Common to Sixth Semester Medical Electronics)

(Regulations 2013)

Time : Three hours

Maximum : 100

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define diffraction and interference.
2. What are black body sources?
3. Mention some important LED materials.
4. What do you mean by mode locking in lasers?
5. What is a bolometer?
6. What are the various modes involved in charge separation of photo diodes?
7. Define Bragg cell.
8. Compare analog and digital modulation.
9. What is meant by plasma etching?
10. What are the advantages of Monolithic Opto electronic integration?

PART B — (5 × 16 = 80 marks)

11. (a) Derive an expression of wave nature of light starting with the Maxwell's Equation. (8)
(16)

Or

- (b) (i) Explain the formation of energy bands in various materials. (8)
- (ii) Derive an expression for electrical conductivity in solids. (8)

12. (a) Explain the following terms. (16)
- (i) Photo luminescence
 - (ii) Cathode luminescence
 - (iii) Electro luminescence
 - (iv) Injection luminescence.

Or

- (b) (i) Discuss the theory of laser emission and population inversion. (12)
- (ii) Write the applications of laser. (4)
13. (a) Explain the principle construction and operation of various thermal detectors. (16)

Or

- (b) Discuss the various parameters used to access the performance of a detector. (16)
14. (a) (i) Explain the operation of a three input threshold logic gate with output characteristic curve. (10)
- (ii) Write short notes on optical cross bar switch. (6)

Or

- (b) Explain with a neat diagram, the construction of electro optic effect based modulator. (16)
15. (a) (i) What is the need for integration of Opto electronic devices and also draw the block diagram of essential elements of an OEIC. (8)
- (ii) Explain the application of Opto electronic integrated circuits. (8)

Or

- (b) Explain the principle and operation of wave guides and couplers in detail. (16)