Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 70418

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Sixth / Seventh Semester

Electronics and Communication Engineering

EC 6016 — OPTO ELECTRONIC DEVICES

(Common to Medical Electronics Engineering)

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Define diffraction and interference.
2. What are black body sources?
3. State few applications of LASER.
4. State few advantages of LED light source.
5. Compare the characteristics of PIN photo diode and avalanche photo diode.
6. What is the principle used in thermal detector?
7. Define magneto optic effect.
8. Calculate the half wave voltage of KTP at a wavelength of 1.06 μm. For KTP, linear electro optic coefficient is 10.6 pm/V and no = 1.51.
9. What is the need for optoelectronic ICs?
10. What is the main advantage of hybrid ICs?

PART B — ($5 \times 13 = 65$ marks)

11. (a) Discuss about various optical sources and its operational principle. (13)

Or

(b) Define various criteria for light sources and discuss about the necessary requirements of semiconductor. (13)

12. (a) (i) Explain the principle of electro luminescence with neat diagram. (6)

(ii) Explain the working principle of Liquid Crystal Display (LCD). (7)

Or

(b) (i) Explain the working of semiconductor laser diode with rate equation. (6)

(ii) Explain the principle of mode locking laser. (7)

13. (a) Explain the principle, construction and operation of various thermal detectors.

Or

(b) Discuss the various parameters used to access the performance of a detector.

14. (a) Describe an electro – optic phase modulator with neat diagram and explain how the phase shift determine the output wave. (13)

Or

(b) Write notes on :

(i) Quantum Confined Stark Effect (QCSE). (7)

(ii) BRAQWET modulator. (6)

15. (a) Discuss about the applications of optoelectronic ICs.

Or

(b) Give a brief account on guided wave devices.

PART C — ($1 \times 15 = 15$ marks)

16. (a) Explain the working principles of any two electro-optic modulators.

Or

(b) Give a brief account on optical switching and logic devices.

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