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A – 3854

Reg. No. :

Name :

Seventh Semester B.Tech. Degree Examination, June 2016
(2008 Scheme)
08.735 : OPTOELECTRONIC DEVICES (TA)
(Elective – III)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions.

1. Briefly explain radiative and non radiative recombination.
2. Compare the performance of p-i-n photodiode and p n photo diode.
3. What is luminescence ? What are the types of luminescence ?
4. Explain deep level transitions.
5. Describe the principle of LED.
6. What are the applications of optoelectronic modulators ?
7. Compare MS and MSM photodiodes.
8. Describe the process of spontaneous emission super radiance and stimulated emission.
9. Discuss some advantages that the laser may have over an LED as a source of optical fiber communication.
10. Calculate the ratio of spontaneous to stimulated emission rates in a tungsten lamp that radiates an average frequency of 5×10^{14} Hz at an operating temperature of 1300°K.
(10×4=40 Marks)



PART – B

Answer **two** questions from **each** Module.

Module – I

11. Briefly explain the absorption and radiation mechanisms in a semi conductor.
12. Explain the techniques used to measure the high speed response of diodes.
13. Explain :
 - a) Hetero junction diodes.
 - b) Noise performance of avalanche photo diodes.

(2×10=20 Marks)

P.T.O.

**Module - II**

14. Write short notes on :
 - a) MS photodiode
 - b) MSM photodiode.
15. Derive the efficiency of LED.
16. Write short note on :
 - a) Wavelength selective detection.
 - b) Coherent detection.

(2×10=20 Marks)**Module - III**

17. Describe with suitable diagrams, the principle of heterojunction laser.
18. Explain the operating principles of junction laser and its threshold current with all necessary equations.
19. a) How can we find the gain in a two level lasing medium ?
 - b) Find the spectral output (number of modes) of an AlGaAs laser supported by the gain spectrum which has a bandwidth of 6 nm. The laser has a cavity length of 200 μm and emission wavelength of 800 nm.

(2×10=20 Marks)