QP CODE: 25020845

25020845

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE / MERCY CHANCE EXAMINATIONS, FEBRUARY 2025

Sixth Semester

B.Sc Electronics Model III

CORE COURSE - EL6CRT17 - OPTOELECTRONICS

2017 Admission Onwards

267ABE0E

Time: 3 Hours Max. Marks : 80

Part A

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. What do you mean by Light Amplification?
2. Why four level active medium is preferred in lasers instead of a three level active medium?
3. How a LASER diode works?
4. Explain LASER diode characteristics.
5. How an LED works?
6. Calculate the efficiency of a PIN silicon photo-detector if the responsivity is 0.58A/Wat 800nm.
7. Explain the principle of photovoltaic device.
8. What is total internal reflection? How it is occurs?
9. Explain the need of cladding in an optical fiber.
10. What are the advantages of optical fibers over copper wires?
11. Why recombination life time is very important in p-n junctions?
12. What is MOKE?

(10×2=20)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. Draw a basic laser structure incorporating mirrors and explain the longitudinal modes of the laser output.

14. Explain laser based 3D printing.

15. Explain how a heterostucture LASER diode works with proper digrams.

16. With neat diagram explain edge emitting LEDs.

17. Write note on quantum efficiency and responsivity of photosensor.

18. With diagram explain the working of a PIN photodiode.

19. With diagram explain how light is propagted in a graded index fiber.

20. Explain waveguide dispersion.

21. With necessary schematics explain an optical amplitude modulator using electro-optic effect.

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. Explain the structure and working of a Ruby laser with necessary schematics.

23. Explain a DHLED with proper digrams.

24. With suitable sketches explain the working and characteristics of APD photodiode.

25. Explain different applications of optical fibers.

(2×15=30)