20U205 (Pages: 2) Name: .....

Reg.No: .....

SECOND SEMESTER BSc DEGREE EXAMINATION, APRIL 2021

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19U PHY2 C02 - OPTICS LASER AND ELECTRONICS

(Physics - Complementary Course)

(2019 Admission onwards)

Time : 2.00 Hours Maximum : 60 Marks

Credit : 2

Part A (Short answer questions)

Answer ***all*** question. Each question carries 2 marks.

1. Explain the phenomenon of interference. Why a thick film cannot produce interference when illuminated with white light?
2. What are Newtons rings? Give its uses.
3. What is meant by plane transmission grating? State the grating law.
4. What is meant by negative and positive crystal.
5. Define optical activity.
6. What is a half wave rectifier?
7. Write down the expression for efficiency and ripple factor of a full wave and bridge rectifier.
8. Draw the practical circuit of a CE transistor amplifier.
9. What is an oscillator? Classify them.
10. Draw the truth tables of OR and AND Gate.
11. What is meant by spontaneous emission?
12. Draw the energy levels and transitions in a ruby laser.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer ***all*** question. Each question carries 5 marks.

13. A parallel beam of sodium light of wavelength 5890 A^o strikes a film of oil floating on water. When viewed at angle of 30^o from the normal 8th dark band is seen. Determine the thicknesss of the film. Refractive index = 1.5.

14. Explain in detail Fraunhofer diffraction due to a single slit.

15. How can we detect if a light is circularly/elliptically/un-polarised using wave plates?

16. How a Zener diode acts as a voltage stabilizer?

17. Explain the working of a feedback amplifier in detail and derive an expression for the voltage gain.

18. State De Morgan's theorem and prove it using examples.

19. Explain the constrution and working of a semiconductor laser.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any ***one*** question. Each question carries 10 marks.

20. Describe an experiment with theory to determine the wavelenth of sodium light using Newtons ring system.

21. Describe Fraunhofer single slit experiment with the necessary theory.

(1 × 10 = 10 Marks)

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