22U205 (Pages: 2) Name: .....

Reg.No: .....

SECOND SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2023

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19U PHY2 C02 / CC20U PHY2 C02- OPTICS LASER AND ELECTRONICS

(Physics - Core Course)

(2019 Admission onwards)

Time : 2.00 Hours Maximum : 60 Marks

Credit : 2

Part A (Short answer questions)

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

1. What is Fresnels biprism? What is its use?
2. Explain why the centre of Newtons rings is dark for reflected light.
3. Explain the intensity distribution in the diffraction pattern of a single slit.
4. What is meant by negative and positive crystal?
5. What is an elliptically polarised light?
6. Explain the functions of half wave rectifier.
7. What are filter circuits?
8. Obtain a relation between alpha, beta and gamma.
9. What is the basic principle of an oscillator?
10. Draw the truth tables of exclusive OR.
11. What are the characterestics of a laser light?
12. What is population inversion?

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. What are the conditions for brightness and darkness for interference by normal incidence.
14. What is a zone plate? Explain the construction and working of a zone plate?
15. A 20 cm long tube containing 50 cm^3 of sugar solution produces an optical rotation of 10^o. Calculate the quantity of sugar contained in the solution. Specific rotation of sugar is 65^o.
16. Derive an expression for the efficiency of a full wave rectifier.

17. Describe the input and output characterestics of common emitter npn transistors.

18. Write the truth table of a NAND gate and using NAND gates construct an OR gate.

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

(Ceiling: 30 Marks)

Part C (Essay questions)

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

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

21. Describe a full wave rectifier circuit and find the equatin for efficiency and ripple factor. Decribe the working of a bridge rectifier circuit.

(1 × 10 = 10 Marks)

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