

25U205SA

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Name:

Reg.No:

SECOND SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2026

(CBCSS - UG)

CC19UPHY2C02 / CC20UPHY2C02 - OPTICS LASER AND ELECTRONICS

(Physics - Complementary Course)

(2019 to 2023 Admissions - Supplementary)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 3

Part A (Short answer questions)

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

1. Explain the phenomenon of interference. Why a thick film cannot produce interference when illuminated with white light?
2. Explain the interference of light by a plane film.
3. What should be the order of the size of obstacle for diffraction of light?
4. What is meant by plane transmission grating? State the grating law.
5. Define the term Birefringence.
6. Define specific rotation.
7. What is a half wave rectifier?
8. Draw the diagram of a centre tapped full wave rectifier.
9. Draw the input characteristics of a CE transistor.
10. Explain NOT gate with its truth table.
11. What are the characteristics of a laser light?
12. How population inversion is achieved in Ruby laser?

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. Explain why Newton's rings are circular in shape.
14. A grating has 6000 lines over it and sodium light is incident normally on it. Find the separation between two wavelengths that can be just resolved in first order spectrum if one wavelength is 6000 Angstrom. Also find the resolving power in second order.

15. A doubly refracting crystal has refractive indices 1.553 for the e-ray and 1.544 for the o-ray. Find the thickness of a quarter wave plate made from the crystal for sodium light of wavelength 689 nm
16. Explain the working of a capacitor filter with a neat diagram.
17. In a CB circuit, the voltage drop across the load resistance of 3000 ohm connected to the collector is 3 V. if α is 0.95, find the value of the base current.
18. Explain XOR gate and write the truth table.
19. Explain the different parts of a laser system.

(Ceiling: 30 Marks)

Part C (Essay questions)

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

20. Explain polarization of light by reflection and Brewster law. Prove that when the light is incident at angle of polarization, the angle between reflected and refracted ray is 90 degree.
21. Explain how a Zener diode can be used as a voltage stabilizer.

(1 × 10 = 10 Marks)
