

25U205S

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Name:

Reg.No:

SECOND SEMESTER INTEGRATED M.Sc. GEOLOGY DEGREE EXAMINATION, APRIL 2026

(CBCSS)

CC23PHY2IC02 - OPTICS LASER AND ELECTRONICS

(Physics)

(2023, 2024 Admissions - Supplementary/Improvement)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 3

Part A (Short answer questions)

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

1. State and explain superposition principle.
2. What are the conditions for sustained interference pattern?
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. What is a quarter and half wave plate?
6. What are filter circuits?
7. Draw the I-V characteristics of Zener diode.
8. Explain the current amplification factor of a transistor
9. Draw the block diagram of a feedback amplifier.
10. Explain NOT gate with its truth table
11. What is meant by induced absorption?
12. What is the role of helium in He-Neon laser?

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. Discuss the formation of interference pattern in a thin film.
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. Explain double refraction. Write a note on positive and negative crystals.

16. A centre tapped rectifier has an input 12 V transformer. Each diode has a forward resistance of 2 ohm. If the load resistance is 500 ohm, find the dc load current and rectification efficiency.
17. Derive the relations connecting current amplification factors alpha, beta and gamma.
18. State De Morgan's theorem and prove it using examples.
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. Discuss the necessary theory for the interference in thin films due to reflected light.
21. Explain the working of a half wave rectifier using neat diagram and derive the expressions for efficiency and ripple factor.

(1 × 10 = 10 Marks)
