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Name:

Reg.No:

SECOND SEMESTER M.Sc. INTEGRATED GEOLOGY DEGREE EXAMINATION, APRIL 2025

(CBCSS)

(Regular/Supplementary/Improvement)

CC23 PHY2 IC02 - OPTICS LASER AND ELECTRONICS

(Physics)

(2023 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 meant by optical path?
2. What is meant by diffraction of light?
3. What is Rayleigh criterion for resolution?
4. Define resolving power and dispersive power of grating.
5. What is polarising angle?
6. Define the term rectification.
7. Write any two advantages of full wave rectifiers over the half wave rectifier?
8. Explain briefly Zener diode as a voltage stabiliser.
9. Obtain a relation between alpha and beta and gamma.
10. What are universal gates?
11. What are the characteristics of a laser light?
12. Write any two differences between spontaneous emission and stimulated emission.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. Explain the superposition of sinusoidal waves.
14. A soap film has a refractive index of 1.33. Find the maximum thickness for zero reflection when light of wavelength 6000 Angstrom is incident normally
15. Explain double refraction. write a note on positive and negative crystals.
16. A 20 cm long tube containing 50 cm³ of sugar solution produces an optical rotation of 10°. Calculate the quantity of sugar contained in the solution. Specific rotation of sugar is 65°.

17. Explain the working of a CE transistor.
18. Explain the concept of feedback. Compare negative feedback and positive feedback.
19. Explain XOR gate and write the truth table.

(Ceiling: 30 Marks)

Part C (Essay questions)

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

20. What are quarter wave plate and half wave plate? Deduce the thickness for a given wavelength in terms of its refractive indices.
21. Explain with proper diagram, the working of a Helium-Neon laser.

(1 × 10 = 10 Marks)
