

23I301S

(Pages: 2)

Name:

Reg. No:

THIRD SEMESTER M.Sc. INTEGRATED GEOLOGY EXAMINATION, NOV. 2024
(CBCSS)

(Supplementary/Improvement)

**CC20 PHY3 IC02 – OPTICS AND SPECTROSCOPY, MODERN PHYSICS,
ELECTRONICS AND NUMERICAL METHODS**

(Physics)

(2020 Admission onwards)

Time: 2 ½ Hours

Maximum: 80 Marks

Credit: 4

Part A (Short answer questions)

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

1. What is meant by constructive superposition?
2. What are coherent sources? Give two examples.
3. Write a short note on the principle of superposition.
4. What is an alpha decay?
5. What are main nuclear wastes?
6. What is C14 dating?
7. What is group velocity?
8. What is the role of helium in He-Ne laser?
9. What is Laser? What are its properties?
10. Explain the Einstein coefficient for stimulated emission.
11. Write two advantages of CE Configuration.
12. What is meant by the ripple factor?
13. What are universal gates?
14. Write use of bisection method.
15. Write the application of least square fitting.

(Ceiling: 25 Marks)

Part B (Short essay questions - Paragraph)

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

16. Explain the interference with white light.
17. How will you test the optical flatness of a glass plate?
18. Explain nuclear binding energies.
19. What is a wave group? Explain the uncertainty principle in position and momentum using wave group.

20. Describe the working of solid state ruby laser.
21. Explain the basic actions of transistor.
22. Explain interpolation method using suitable example.
23. Describe a method to solve an algebraic equation using suitable example.

(Ceiling: 35 Marks)

Part C (Essay questions)

Answer any *two* questions. Each question carries 10 marks.

24. Explain the theory of interference. Obtain an expression for the intensity distribution when two coherent waves interfere.
25. (a) What are the laws of photo electric effect?
(b) Derive Einstein's photo electric equation.
(c) How can we determine the value of Planck's constant and work function of the metal from graph connecting frequency of the incident photon and the kinetic energy of the electrons in the metal surface.
26. Explain the principle, construction and working of a semiconductor laser.
27. Discuss about filter circuits and explain voltage stabilization using zener diode.

(2 × 10 = 20 Marks)
