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T – 2551

Reg. No. : .....

Name : .....

Fourth Semester B.Sc Degree Examination, July 2024

First Degree Programme under CBCSS

PHYSICS

Complementary Course for Chemistry

PY 1431.2 : ATOMIC PHYSICS, QUANTUM MECHANICS AND ELECTRONICS

(2018 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer **all** questions in **one** or **two** sentences.

1. What is Bohr's correspondence principle?
2. State Pauli's exclusion principle.
3. Give the properties of super conductors.
4. What is isotopic effect in superconductor?
5. Define probability density.
6. What is wave function?
7. Define emission spectroscopy?

P.T.O.

8. What region of the spectrum is radio?

9. What is the need for biasing?

10. Draw the AND gate and its truth table.

(10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions.

11. Explain spin orbit coupling.

12. Write a short note on periodic table?

13. Explain Meissner effect.

14. List out the application of super conductors.

15. Explain visible rays.

16. Discuss the Planck's hypothesis.

17. Explain Zener diode and its V- I Characteristics.

18. What is operating point? How will you stabilize it?

19. Compare emitter feedback bias and voltage divider bias.

20. Give the difference between IR and microwave spectra.

21. Discuss the behavior of a pn junction under forward and reverse biasing.

22. Convert the following decimal number in to binary number.

    (a) 25

    (b) 11.8125

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six** questions.

23. Discuss the vector atom model.

24. Obtain an expression for magnetic moment of orbiting electrons.

25. Explain high temperature ceramic superconductors.

26. Differentiate the Type I and Type II superconductors.

27. Discuss AC load line and DC load line of transistor biasing.

28. Explain the principle of UV and Microwave spectrometer.

29. An electron is trapped in one dimensional potential region of length 1.0×10^{-10}m. How much energy must be supplied to excite the electron from the ground state to the first excited state.

30. Define ripple factor? Obtain an expression for ripple factor of a bridge rectifier.

31. Explain Hexadecimal number and Octal numbers with examples.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions.

32. (a) Explain the basic feature of Bohr atom model.

    (b) Discuss the different quantum numbers that define an energy state.

33. Briefly explain the working of CE transistor amplifier and discuss the amplifier gain, frequency response and band width.

34. Derive Schrodinger Time dependent and independent wave equation.

35. Explain the following gates giving symbol, truth table and Boolean equations.

(a) OR

(b) AND

(c) NOT

(d) NOR

(e) NAND

(2 × 15 = 30 Marks)
