



22100531

QP CODE: 22100531

Reg No :

Name :

**B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS,
APRIL 2022**

Third Semester

**COMPLEMENTARY COURSE - PH3CMT02 - PHYSICS - MODERN PHYSICS AND
MAGNETISM**

Common to B.Sc Chemistry Model I & B.Sc Geology Model I

2017 Admission Onwards

7CF9E43D

Time: 3 Hours

Max. Marks : 60

Part A

*Answer any **ten** questions.*

*Each question carries **1** mark.*

1. Show that orbital magnetic moment is directly proportional to orbital angular momentum.
2. List any two properties of gamma rays.
3. What is transient equilibrium?
4. Write down the Schrodinger equation for a time dependent particle moving in a three dimensional potential.
5. Graphically represent the wave functions for three lowest energy levels of a particle in a box and the corresponding probability distributions.
6. What do you understand by singlet, doublet and triplet states?
7. Distinguish between Stokes lines and anti-Stokes lines.
8. Explain the p-n junction potential barrier.
9. What is the function of a rectifier?
10. Why is an ordinary junction transistor called bipolar?





11. Explain the temperature dependency of ferromagnetic susceptibility.
12. What are magnetographs?

(10×1=10)

Part B

Answer any **six** questions.

Each question carries **5** marks.

13. Find the ratio of nuclear radii of gold isotope ${}_{79}\text{Au}^{197}$ and silver isotope ${}_{47}\text{Ag}^{107}$.
14. If the disintegration constant of a radioactive substance is 0.00231 per day, find its half-life period.
15. An electron is confined to move in a cubical box of side 1 \AA . Calculate the minimum uncertainty in its velocity. Given mass of electron = $9 \times 10^{-31} \text{ kg}$. $h = 6.62 \times 10^{-34} \text{ Js}$.
16. A $2.72 \times 10^{15} \text{ Hz}$ electron acquires $1.1 \times 10^{-18} \text{ J}$ of kinetic energy. What is the work function of the metal?
17. The bond length of HCl molecule is $136 \times 10^{-12} \text{ m}$. Calculate the rotational constant of HCl.
18. A silicon diode has a forward voltage drop of 1.2V for a forward dc current of 100mA. It has a reverse current of 1 micro-ampere for a reverse voltage of 10V. calculate (a) bulk and reverse resistance of the diode.(b) ac resistance at forward dc current of 2.5mA.
19. What is zener diode? How it is operated?
20. What are the advantages of a full wave bridge rectifier over that of a centre tap full wave rectifier.
21. The magnetization produced in a material when it is placed in a magnetizing field of 200 A/m is -1 A/m. Calculate a) Susceptibility and b) Relative Permeability. What is the type of magnetism present?

(6×5=30)

Part C

Answer any **two** questions.

Each question carries **10** marks.





22. Give an account of the Bohr model of atom. Explain the origin of spectral lines of hydrogen on the basis of this theory.
23. Give a comparative study on
 - a) Fluorescence and Phosphorescence
 - b) Infra Red and Raman spectroscopy
24. With a neat diagram describe the action of a full wave bridge rectifier Compare the merits over that of a center tap full wave rectifier.
25. Discuss about earth's magnetism and with help of diagram, explain the components of earth's magnetic fields.

(2×10=20)

