QP CODE: 24026895

24026895

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) REGULAR / IMPROVEMENT / REAPPEARANCE EXAMINATIONS, OCTOBER 2024

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

3EDCAFA5

Time: 3 Hours Max. Marks : 60

Part A

*Answer any **ten** questions.*

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

1. Explain the concept of spin of electron.
2. Briefly explain L-S coupling.
3. What are isotopes? Give one example.
4. What do you understand by the term normalization?
5. Mention the transitions studied in ultra violet and visible spectroscopy.
6. What is Raman effect?
7. What do you understand by NMR? To which property is it linked to?
8. What is the effect of biasing a p-n junction?
9. What is the ripple factor of a half wave rectifier?
10. Why an ordinary junction transistor is called bipolar?
11. What is meant by magnetic hysteresis?
12. What is meant by magnetostriction?

(10×1=10)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. If the disintegration constant of a radio active substance is 9.435×10^{-8}, calculate its half-life period.

14. If the disintegration constant of a radioactive substance is 0.00231 per day, find its half-life period.

15. Find the energy of the neutron in units of electron Volt whose de Broglie wavelength is 10^{-10} m .

16. Calculate the maximum kinetic energy of an electron ejected from silver by a 3.13×10^{15}Hz photon. Given work function of silver- 4.73 eV.

17. If the wave function $\psi(x) = A \sin kT$ satisfies the time – independent Schrodinger equation . Find the form of the potential V(x).

18. A silicon diode of forward resistance 13 Ω is connected in series with an ac voltage of peak value 24 V and a load resistance of 220 Ω. Calculate the peak current and peak voltage across the load.

19. Obtain the expression for the efficiency of a half wave rectifier and a full wave rectifier.

20. What are the advantages of a full wave bridge rectifier over that of a centre tap full wave rectifier?

21. A coil of 250 turns is wound over uniformly on a magnetic rod of 0.8m long. If a current of 0.1 A is sent through it calculate (i) the magnetizing field H (ii) intensity of magnetisation M (iii) magnetic induction B and relative permeability of the material. Given Susceptibility = $8 \times 10.^{-3}$

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **10** marks.*

22. Discuss the properties of atomic nucleus.

23. Describe schematically the fine structure of Hα line.

24. Explain the working of a Zener diode. Describe its V-I characteristics.

25. Discuss about earth's magnetism and with help of diagram, explain the components of earth's magnetic fields.

(2×10=20)