QP CODE: 23126998

Reg No : ....

Name : ....

B.Sc DEGREE (CBCS) REGULAR / IMPROVEMENT / REAPPEARANCE EXAMINATIONS, OCTOBER 2023

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

D58B689B

Time: 3 Hours

Max. Marks : 60

Part A

*Answer any **ten** questions.*

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

1. In which region can you find Lyman series in Hydrogen spectrum.

2. What is natural radioactivity?

3. State the condition for secular equilibrium in radioactivity.

4. Show that Planck's law reduces to Rayleigh Jean's law at low frequency radiations.

5. What do you understand by singlet, doublet and triplet states?

6. Mention the transitions studied in Microwave spectroscopy.

7. Write down the different modes of vibration for a molecule having no centre of symmetry.

8. Define dynamic resistance of a p-n junction diode in forward biased condition.

9. Distinguish between diffusion current and drift current.

10. What is the value of ripple factor of a bridge rectifier without filter?

11. Draw the magnetization curve of ferromagnetic substances.

12. What is meant by magnetostriction?

(10×1=10)

Part B

*Answer any **six** questions.*

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

13. Given the mass of proton= 1.007825 u, mass of neutron =1.008665 u and mass of deuteron =2.0113u. Calculate the binding energy of deuteron.

14. The half-life of radon is 3.82days.In what time will the activity decays to $(1/16)^{th}$ of its original value?

15. Find the energy of a 800 nm photon.

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

17. What is the probability of finding the particle in between 0.4 L and 0.6 L in a one-dimensional box of length L.

18. A half wave rectifier is used to supply 50 V dc to a resistive load of 800 Ω, find: (i) Im (ii) Idc (iii) Irms (iv) dc power output (v) dc output voltage

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 magnetic field of 1.6×10^3 A/m produces a flux of 2.4×10^{-5} Wb in a bar of iron of cross section 0.2 cm^2. Calculate the permeability and susceptibility of the specimen.

(6×5=30)

Part C

Answer any two questions.

Each question carries 10 marks.

22. Explain vector atom model. Discuss the quantum numbers associated with vector atom model.

23. Briefly explain with a diagram the experimental set to study Raman effect. Discuss the quantum theory of Raman effect.

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)