B.Sc DEGREE (CBCS)EXAMINATION, MARCH 2021

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

FF66F457

Time: 3 Hours   Max. Marks : 60

Part A

*Answer any **ten** questions.*

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

1. State the postulates of Bohr atom model.

2. Mention the properties of nuclear forces.

3. State and explain Soddy's displacement law.

4. What is a black body? Does a black body actually exist?

5. Write down the Schrodinger equation for a time dependent free particle in one dimension.

6. Discuss the term stationary state.

7. Schematically represent the fine structure transitions of Hα line.

8. What is the effect of temperature on the reverse current of a p-n junction?

9. What is the ripple factor of a full wave bridge rectifier?

10. What is the significance of the arrow-head in the transistor symbol?

11. Distinguish between magnetic induction and magnetic field intensity.

12. What is meant by magnetostriction?

(10×1=10)

Part B

*Answer any **six** questions.*

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

13. Obtain the relation between half-life and decay constant.

14. Describe the determination of age of a fossil sample using radiocarbon dating.

15. The work function of potassium surface is found to be 2.1 eV. Calculate the threshold wavelength of incident radiation if the stopping potential is 0.43 V for the electron.

16. The lowest energy for a particle trapped in 1-dimensinal box is 3.2×10^{-18}J. Calculate the next three possible higher states of energies the particle can have in eV.

17. The J=0 to J=1 absorption line of CO occurs at frequency 1.153×10^{11} Hz, Calculate the M.I, bond length of the molecule for J=1.

18. An ac voltage of peak value 20 V is connected in series with a silicon diode and load resistance of 500 Ω. If the forward resistance of diode is 10 Ω, find: (i) peak current through diode (ii) peak output voltage. What will be these values if the diode is assumed to be ideal?

19. A 6.2V zener is connected to load of 500 ohm. With the series resistance of 220 ohm to a source of 12V. Calculate (1)Output voltage (2)load current (3) zener current

20. A full wave rectifier using four diodes of constant forward resistance of 11.5 ohm is used to rectify an ac voltage of rms 12V If the load resistance is 167 ohm calculate the maximum and the mean load current.

21. Explain how ferromagnetism depends on temperature and Draw and explain hysteresis cure for a ferromagnetic material.

(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. Give a comparative study on a).Fluorescence and Phosphorescence b).. Infra Red and Raman spectroscopy

24. Draw the circuit diagram and explain the working of a half wave diode rectifier.Explain ripple voltage and ripple factor.

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

(2×10=20)