QP CODE: 21100484

21100484

Reg No : .....

Name : .....

# B.Sc DEGREE (CBCS)EXAMINATION, MARCH 2021

## Third Semester

## Complementary Course - PH3CMT01 - PHYSICS-MODERN PHYSICS AND ELECTRONICS

Common to B.Sc Mathematics Model I, B.Sc Statistics Model I

2017 Admission Onwards

45A32BB0

Time: 3 Hours Max. Marks : 60

### Part A

*Answer any **ten** questions.*

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

1. What do you mean by magnetic orbital quantum number?
2. Explain the term Bohr magneton.
3. Write the relation between half-life and mean-life of an element.
4. Write down the different transitions that occur in molecular spectra.
5. What are the features of Raman effect?
6. What do you understand by NMR? To which property is it linked to?
7. Explain what is reverse saturation current?
8. Name the breakdown mechanism in a lightly doped p-n junction under reverse biased condition.
9. What is the function of a rectifier?
10. What is meant by LSB and MSB?
11. Convert the decimal number 1397 into the hexadecimal number.
12. Define the basic rules of Boolean addition and multiplication.

(10×1=10)

### Part B

*Answer any **six** questions.*

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

13. Estimate the B.E of $^{15}P_{31}$.Massof$^{15}P_{31}$ =30.97376 u. Mass of proton=1.007825u, mass of neutron =1.008665 u

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

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

16. Calculate the maximum kinetic energy of an electron ejected from silver by a 3.13 $x10^{15}$Hz photon. Given work function of silver- 4.73 eV

17. The electron in the hydrogen atom makes transitions from a -1.51 eV to -3.4 eV state. Calculate the wavelength of the spectral line emitted, 1eV = 1.6 $x10^{-19}$ J, h = 6.62$x10^{-34}$ Js.

18. How does a zener diode maintain a constant voltage across it?

19. Explain the action of transistors. Why should the base region be always thin?

20. Find the 2's complement of 1100.

21. Using the truth table, show that (1) A+AB=A (2) A+$\bar{A}$B=A+B

(6×5=30)

**Part C**

*Answer any **two** questions.*

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

22. Briefly explain the important properties of the nucleus.

23. Obtain the Planck's radiation law. Discuss the high and low frequency limits.

24. Describe the principle and working of half wave and full wave rectifiers. Show that rectification efficiency of a full wave rectifier is twice that of a half wave rectifier.

25. What are adder circuits? Explain the following: Half adder and full adder, truth tables and circuit diagram.

(2×10=20)