19102044

QP CODE: 19102044

Reg No : .....

Name : .....

B.Sc. DEGREE (CBCS) EXAMINATION, OCTOBER 2019

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

E7F37D81

Maximum Marks: 60 Time: 3 Hours

Part A

*Answer any **ten** questions.*

Each question carries 1 mark.

1. In which region can you find Lyman series in Hydrogen spectrum.
2. State Pauli's exclusion principle.
3. State the condition for secular equilibrium in radioactivity.
4. What is a black body? Does a black body actually exist?
5. Write down the Schrodinger equation for a time dependent particle moving in a three dimensional potential.
6. What do you understand by Eigen function? Write down the normalized eigen function for a particle in a box.
7. What is Peak Inverse Voltage of a diode in a rectifier circuit?
8. What is Zener effect?
9. The output resistance of a CB transistor is very high . Why?
10. Explain why hexadecimal code is widely used in digital systems.
11. Convert the hexadecimal number 8BC into the binary number.
12. How will you represent positive numbers and negative numbers in 2's complement scheme?

(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 a radioactive sample is 1 year. Calculate its mean life.
15. Calculate the time required for 10% of sample of Thorium to disintegrate. Assume the half-life of Thorium to be 1.4×10^{10} years.
16. 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?
17. The bond length of HCl molecule is 136×10^{-12} m. Calculate the rotational constant of HCl.
18. Explain the formation of a p-n junction.
19. Obtain the ripple factor of (a) Half wave rectifier (b) Full wave rectifier
20. Reduce $AB+ABC+\bar{A}B+ABC$ using laws of Boolean algebra.
21. Draw the logic circuit and explain the function of a half adder.

(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. Describe a). Compton effect b). Davisson- Germer Experiment.
24. With a neat diagram describe the action of a full wave bridge rectifier. Compare its merits over that of centre tap full wave rectifier.
25. Show that NAND and NOR are Universal gates.

(2×10=20)