24026922

QP CODE: 24026922

Reg No : .....

Name : .....

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

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

40488D9D

Time: 3 Hours Max. Marks : 60

Part A

*Answer any **ten** questions.*

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

1. State Pauli's exclusion principle.
2. Represent graphically the variation of packing fraction with mass number.
3. Explain the uses of carbon dating.
4. What do you understand by Eigen function? Write down the normalized eigen function for a particle in a box.
5. What do you understand by singlet, doublet and triplet states?
6. Mention the transitions studied in Infra red spectroscopy.
7. Draw the input and output waveforms of a half wave rectifier.
8. What is the ripple factor of a full wave bridge rectifier?
9. Write down the transistor current equation. Why base current is always small?
10. Convert the binary fraction 0.110 into the decimal form.
11. What are the multivariable theorems of Boolean algebra? Give two example.
12. What are the universal gates? Why are they called so?

(10×1=10)

Part B

*Answer any **six** questions.*

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

13. Calculate the radii of first, second and third permitted Bohr orbits of hydrogen atom.
14. Explain Radioactive series. What are the different radioactive series found in nature?
15. The half life of $^{92}U_{238}$ against alpha decay is 4.5 x10^9 years. Calculate the number of disintegrations taking place in 5 gm of the substance in unit time.
16. An electron has a speed of 1.05x10^4 m/s within an accuracy of 0.02%. Calculate the uncertainty in the position of the electron.
17. If the work function of silver is 3.83 eV, What is the longest wavelength of sunlight that can eject an electron from a silver surface?
18. What is zener diode? How it is operated?
19. Draw and compare the output waveform of full wave and half wave rectifier.
20. Explain what are octal and hexadecimal systems.
21. State the rules for binary subtraction. Explain 1's complement and 2's complement method with example.

(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. Obtain the time dependent Schrodinger equation for a free particle.
24. Explain the V-I characteristics of a diode.
25. What are adder circuits? Explain the following: Half adder and full adder, truth tables and circuit diagram.

(2×10=20)