



23145783

QP CODE: 23145783

Reg No :

Name :

B.Sc DEGREE (CBCS) REGULAR / IMPROVEMENT / REAPPEARANCE

EXAMINATIONS, DECEMBER 2023

First Semester

Core Course - PH1CRT01 - METHODOLOGY AND PERSPECTIVES OF PHYSICS

(Common to B.Sc Physics Model I, B.Sc Physics Model II Applied Electronics, B.Sc Physics Model II Computer Applications, B.Sc Physics Model III Electronic Equipment Maintenance)

2017 Admission Onwards

DB1DBBCD

Time: 3 Hours

Max. Marks : 60

Part A

*Answer any **ten** questions.*

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

1. What was Einstein's explanation on Brownian motion?
2. What was the original name given to electrons by J J Thomson?
3. Name any unit of radioactivity and define it.
4. What is the quantum of electromagnetic radiation?
5. What is the advantage of 10's complement over 9's complement.
6. Write the rules for binary multiplication.
7. Perform 1's complement subtraction by converting the decimal numbers 12 -15 to binary. Verify the result in decimal number system.
8. When do you say a vector A is a solenoid.
9. A pendulum clock gives a correct time at the equator. Will it gain time or loose time if it is taken to the poles and why?
10. What happens if an ammeter is connected in parallel with a circuit?
11. Define error.
12. What are the different ways of expressing an error?

(10×1=10)

Part B



Answer any **six** questions.

Each question carries **5** marks.

13. Write a note on the contributions of Erwin Schrodinger.
14. Write a note on the contributions of J C Bose.
15. Briefly explain the method of representing positive and negative numbers in 1's complement and 2's complement scheme with two suitable examples.
16. A particle is acted upon by constant forces $6\mathbf{i} + \mathbf{j} - 3\mathbf{k}$ and $3\mathbf{i} + \mathbf{j} - \mathbf{k}$ is displaced from the point $\mathbf{i} + 2\mathbf{j} + 3\mathbf{k}$ to the point $5\mathbf{i} + 4\mathbf{j} + \mathbf{k}$. Find the total work done by the forces
17. Verify if the vector field $\mathbf{F} = 6x\mathbf{i} + (2y - y^2)\mathbf{j} + (6z - x^3)\mathbf{k}$ is conservative
18. In an instrument, there are 25 divisions on the vernier scale which coincides with 24 division of the main scale. 1 cm on main scale is divided into 20 equal parts. Calculate the least count of the instrument.
19. A star is located 9 light-year away from us. What is the distance in Par sec? What is the parallax shown by this star when viewed from two locations 3×10^{11} m apart?
20. What is the perimeter of a soccer field if its length and width were measured to be 95.82 m and 71.836 m respectively?
21. A worker is fitting a new carpet in a room. He measures the length of the room as 7.10 ± 0.05 m and the width as 3.45 ± 0.05 m. How much carpet should he buy to be "safe"?

(6×5=30)

Part C

Answer any **two** questions.

Each question carries **10** marks.

22. Describe Galileo's contributions in the fields of astronomy and mechanics.
23. Write down the steps to subtract bigger number from smaller number and vice versa in 1's complement form. Perform the following subtraction in 1's complement and check the result in ordinary binary subtraction method. i) $1101 - 1010$ ii) $100001 - 1001$ iii) $101 - 11101$ iv) $11001 - 11$ v) $101.01 - 11.01$
24. Explain a) ASCII code b) BCD code. How are these different from the number systems?
25. Compare and contrast the use of a Travelling microscope and SONAR. Give one application for each.

(2×10=20)