24046258

**QP CODE: 24046258**

**Reg No :** .....

**Name :** .....

# B.Sc DEGREE (CBCS) IMPROVEMENT/REAPPEARANCE/MERCY CHANCE EXAMINATIONS, DECEMBER 2024

## 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

39F218A8

Time: 3 Hours Max. Marks : 60

**Part A**

*Answer any **ten** questions.*

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

1. Write down the year and the contribution for which Albert Einstein was awarded Nobel prize.
2. Which are the two elements discovered by Marie Curie?
3. Write down the year and the contribution for which Heisenberg was awarded Nobel prize.
4. What is the major contribution of Meghnad Saha to physics?
5. Break each hexadecimal number down into a sum of product of digits and their appropriate weights: a. $(1BA)_{16}$ b. $(CAB)_{16}$
6. Evaluate using 1's complement subtraction a. 110011 - 110 b. 101 -11101
7. The number of bits used to represent a six digit decimal number in BCD is
8. Express the fundamental theorem for divergence.
9. How do you define one kilogram in SI units?
10. What is meant by precision? Can we say an instrument of high precision is accurate?
11. How errors are combined in addition?
12. Define standard deviation.

(10×1=10)

**Part B**

*Answer any **six** questions.*

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

13. What was the purpose of J J Thomson's cathode ray experiment and what was his conclusion?
14. Write a note on the contributions of Max Plank.
15. Perform the binary arithematic: i) 1011.11+ 1101.01 + 111 ii) 11.01 - 10.11 +111.1 iii) 101.11 + 100.10 - 101.00 +110.10
16. Explain the difference between the 1's complement and 2's complement methods by considering the binary subtraction of the decimal number 20 from 25
17. Show that the vectors a = 2i + 3j+ k, b = i - j, c = 7i + 3j + 2k are coplanar.
18. Describe the working of a pendulum clock.
19. A moving coil galvanometer of resistance 100Ω is used as an ammeter by connecting a shunt resistance of 0.1Ω. The maximum deflection current in the galvanometer is 100μA. Find the current in the circuit, so that the ammeter shows maximum deflection,
20. A sprinter runs 25.3 m in 4.1 s. What was his average speed?
21. The time period of a simple pendulum is measured and the following readings are obtained in seconds: 1.01, 1.03, 1.02, 1.06, and 1.02. Calculate the (i) mean value of the length of the pendulum, (ii) absolute error in each measurement and (iii) percentage error.

(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. What are the rules of binary subtraction? Perform the following binary subtraction and check it in decimal number system: i) 10010.11 - 1101.1 ii) 11101 - 101.1101 iii) 0.11 - 0.001 iv) 0.101 - 0.0111 v) .001 - 0.0001101
24. Find the curl of the following functions:
    i) $f = \frac{X\,i + Y\,j}{X + Y}$  ii) f = x cos z i + y log x j - $z^2$ k  iii) f = $x^2$ i + $y^2$ j + $z^2$ k
25. Compare and contrast the use of a Travelling microscope and SONAR. Give one application for each.

(2×10=20)