QP CODE: 23104632

23104632

Reg No : .....

Name : .....

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

D7314125

Time: 3 Hours Max. Marks : 60

Part A

*Answer any **ten** questions.*

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

1. Who is the author of "Dialogue Concerning the Two Chief World Systems"?
2. What is Curie's law?
3. Who discovered Argon?
4. Write down the year and the contribution for which C V Raman was awarded Nobel prize.
5. Convert the binary number 101012 to decimal.
6. What is the 1's complement of 1's complement of a number?
7. Obtain the decimal equivalent of the BCD number 0100 0011 1001
8. Give its physical significance of curl of a vector function.
9. Why a physical balance is enclosed in a glass case?
10. Explain the term "Ping" with reference to SONAR.
11. Why pendulum clocks require windings?
12. Define rounding error.

(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 Werner Heisenberg.

15. Perform the binary multiplication: i) 11 x 11 ii) 111 x 101 iii) 1011 x 1001.

16. Subtract the following decimal numbers in the 1's compliment method after converting to binary: i) 12 -7 ii) 15 - 32 iii) 8 - 16

17. Calculate the line integral of the function $A = y^2\, i + 2x(y + 1)\, j$ from the point (1,1,0) to the point (2,2,0) along the paths (1,1,0) → (2,1,0) and (2,1,0) → (2,2,0)

18. A galvanometer of 24Ω resistance can carry a full load of 500 μA. If it is shunted by a resistance of 3 Ω, how much current can this system carry without damage?

19. It is claimed that the two Caesium clocks, if allowed to run for 100 yrs, free from external disturbances, may differ by 0.02s. What is the accuracy of this clock in measuring a time interval of 1s?

20. The length and breadth of a room is measured as l=27.4 ±0.3 m, b=3.45±0.2 m, respectively. If the height of the room is h=4.1 ±0.1 m, calculate the following quantities, with percentage and absolute errors; (a) floor perimeter, (c) floor area, (d) large wall area, (e) difference between the length and width of the floor, (f) volume of the space.

21. Calculate the focal length of a spherical mirror from the following observation. Object distance= u=50.1±0.5 cm, image distance v=20.1 ± 0.2 cm

(6×5=30)

Part C

*Answer any **two** questions.*

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

22. Discuss the contributions of Isaac Newton and Albert Einstein to physics.

23. Write down the rules of binary addition. Perform the following binary addition and check it in decimal number system **i)** 101.11 + 11.01 **ii)** 111.0011 + 111.111 **iii)** 1010 + 1010.111.110 **iv)** 11101.001 + 1010.01 **v)** 11111.11 + 11111.11

24. Prove that (i) $div\ grad\ \phi = \nabla^2\phi$ ii) $curl\ grad\ \phi = \nabla \times (\nabla\phi) = 0$ iii) $div\ curl\ f = \nabla . (\nabla \times f) = 0$ iv) $curl\ curl f = \nabla \times (\nabla \times f) = grad\ div\ f - \nabla^2 f$, where ϕ is a scalar and f is a vector quantity.

25. Describe in detail how a spectrometer and stellar parallax is used for measuring angle.

(2×10=20)