

QP CODE: 19103030



19103030

Reg No : 180021042417

Name : Nazim

**B.Sc.DEGREE (CBCS) EXAMINATION, NOVEMBER 2019**

**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

1069F01A

Time: 3 Hours

Maximum Marks :60

**Part A**

*Answer any ten questions.*

*Each question carries 1 mark.*

- ✓ 1. What is photoelectric effect?
2. Explain Rayleigh scattering.
3. What is a black body?
4. C V Raman is the founder of which research institute and where it is located?
- ✓ 5. Break each decimal number down into a sum of product of digits and their appropriate weights: a. 365 b. 17.542
- ✓ 6. Represent the given binary numbers in 1's complement form a) 11110 b) 101010 c) 000011
7. Find the gradient of the function  $F(x,y,z) = e^x \sin(y) \ln(z)$ .
8. Define a line integral. When is a vector field  $F$  said to be conservative?
9. What do you understand by the sensibility of a balance?
10. Define one meter.
11. What is basic principle in atomic clocks?
12. Define relative error.

(10×1=10)





**Part B**

*Answer any six questions.*

*Each question carries 5 marks.*

- ✓ 13. What were Galileo's principle contributions to the advance of science?
- 14. Write a note on the contributions of Werner Heisenberg.
- ✓ 15. Add the following binary numbers: a)  $1100+1001$  b)  $100+1010$  c)  $1111+11$
- ✓ 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. If  $a = -2i - 3j$ ,  $b = -i - 2j + 3k$  and  $c = -i + 2j + k$ , find the projection of the vector  $a$  onto vector  $d = b \times c$ .
- ✓ 18. A moving coil galvanometer of resistance  $100\Omega$  is used as an ammeter by connecting a shunt resistance of  $0.1\Omega$ . The maximum deflection current in the galvanometer is  $100\mu A$ . Find the current in the circuit, so that the ammeter shows maximum deflection.
- 19. Write a note on fundamental units.
- 20. A sprinter runs 25.3 m in 4.1 s. What is his average speed?
- ✓ 21. In a projectile motion experiment, series of measurements on the distance travelled by the projectile gives 30 cm, 32 cm, 29 cm, 28 cm, 31 cm. What is the mean value and error (standard deviation) of the result?

(6×5=30)

**Part C**

*Answer any two questions.*

*Each question carries 10 marks.*

- 22. Discuss the scientific contributions of Pierre Curie and Mary Curie.
- ✓ 23. Perform the subtraction of following binary numbers in 2's complement method, check in 1's complement method a)  $1100 - 100$  b)  $11011 - 1101$  c)  $11010 - 11$  d)  $111 - 1000$  e)  $11101.11 - 10.01$
- ✓ 24. What is the advantage of BCD number system over binary system. Convert the following BCD to decimal and then to hexadecimal code: i)  $1001\ 0110\ 1000$  ii)  $0001\ 0101\ 1000\ 0001$  iii)  $0010\ 0101\ 0110\ 0111$  iv)  $1000\ 0100\ 0010\ 0001$  v)  $0001\ 0000\ 0010\ 0100$  vi)  $0010\ 0101\ 0110$ .  
*Handwritten notes: 1001 0110 1000 → 93210, 0001 0101 1000 0001 → 1B765A3210, 0010 0101 0110 → 2123A*
- ✓ 25. Define Error? How are errors classified?

(2×10=20)