LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **PHYSICS**

FOURTH SEMESTER – **APRIL 2014**

PH 4206/4200 - PHYSICS FOR MATHEMATICS - II

Date : 01/04/2014   Dept. No. \[\]   Max. : 100 Marks
Time : 01:00-04:00

PART A

Answer **ALL** the questions   (10 × 2 = 20)

1. Convert $(21.6)_{10}$ into a binary number.

2. What is a flip-flop?

3. State the laws of photoelectric emission.

4. State Pauli's exclusion principle.

5. What is mass defect?

6. How are neutrons classified based on their energies?

7. How does velocity of sound depend on pressure and temperature?

8. Define reverberation time.

9. State Heisenberg's uncertainty principle.

10. What is a black body?

PART – B

Answer any **FOUR** questions   (4 × 7.5 = 30)

11. State and prove De Morgan's theorems.

12. Describe the vector atom model and explain the different quantum numbers associated with it.

13. Classify nuclei as isotopes, isobars, isotones, isomers, and mirror nuclei - Give examples

14. Give the conditions for good acoustics in an auditorium.

15. Discuss the wave nature of matter and obtain an expression for de Broglie wavelength for matter waves.

PART – C

Answer any **FOUR** questions   (4 × 12.5 = 50)

16. Explain with a neat diagram the working of a decade counter using flip flops.

17. Describe the different types of photoelectric cells and explain their working.

18. a) Explain the classification of elementary particles.   (8)

b) Discuss the conservation laws. (4.5)

19. Define reverberation time. Derive Sabine's formula for reverberation time.

20. Derive Schrodinger's time dependent and time independent wave equations.