



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – MATHEMATICS

FOURTH SEMESTER – APRIL 2017

PH 4206- PHYSICS FOR MATHEMATICS - II

Date: 29-04-2017
09:00-12:00

Dept. No.

Max. : 100 Marks

Part A

Answer all Questions:

(10×2 = 20 marks)

1. What is a flip flop?
2. Convert the hexadecimal number B2 to binary.
3. State the laws of photo electric emission
4. Give two medical applications of X-rays.
5. What is atomic number and mass number?
6. What are elementary particles?
7. Mention any four properties of Ultrasonic waves.
8. Define reverberation time.
9. State Heisenberg's uncertainty principle.
10. State Wien's displacement law.

Part B

Answer any four Questions:

(4×7.5 = 30 marks)

- 11.(a) Convert the given expression in canonical sop form $Y = AC + AB + BC$.
(b) State De Morgan's theorem.
12. Derive expression for the energy of an electron in nth orbit of an atom.
- 13.(i) Define the terms (a) half life (b) average life. Find out the relationship with the decay constant(λ)
(ii) A radioactive nucleus has a decay constant $\lambda = 0.3465 \text{ (day)}^{-1}$. How long would it take the nucleus of decay to 75% of its initial amount?
14. Discuss any five applications of ultrasonic waves.
15. With a neat diagram, explain in detail the Davisson and Germer experiment.
16. What is piezoelectric effect? Explain in detail the working of the Piezoelectric generator.

Part C

Answer **any four** Questions:

(4×12.5 = 50 marks)

17. With a neat diagram, explain in detail the working of a half and full binary adder.
18. Explain Millikan's experiment with the help of a diagram and prove Einstein's photoelectric equation.
- 19.(a) Classify nuclei as isotopes, isobars, isotones, isomers, and mirror nuclei - Give examples.

(b) Explain the classification of elementary particles.
20. Derive Newton's formula for velocity of sound wave and explain the effect of temperature and pressure on velocity of sound.
21. Derive time dependent and time independent wave equation.
22. What are the different types of photoelectric cells? Explain any two in detail.
