



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – CHEMISTRY

FOURTH SEMESTER – APRIL 2018

16UPH4AL01- PHYSICS FOR CHEMISTRY - II

Date: 25-04-2018
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

PART-A

Answer ALL the questions

(10x2=20)

1. What is a semiconductor?
2. Draw the symbol of an ideal op-amp.
3. State Pauli's exclusion principle.
4. Write any two laws of photo-electric emission.
5. Find nuclear density for 1.67×10^{-27} kg of mass of the nucleon. Given $r_0 = 1.3 \times 10^{-15}$ m.
6. State any two basic properties of nuclear forces.
7. Define ionic bond.
8. Differentiate between elastic deformation and plastic deformation of a solid material.
9. State Heisenberg's uncertainty principle.
10. State Planck's law.

PART-B

Answer any FOUR questions

(4x7.5=30)

11. Discuss the different types of extrinsic semiconductors with neat energy band diagrams.
12. Give a brief note on continuous and characteristic X-ray spectrum.
13. Explain nuclear fission process on the basis of liquid drop model.
14. Give the structure of polyethylene, polyvinyl chloride (PVC) and polystyrene from monomer.
15. Derive Schrodinger time-dependent wave equation.
16. a) What is an LED? Describe its working (5.5)
b) What is the value of the series resistor required to limit the current through a LED to 20mA for a forward voltage drop of 1.6 V when connected to 10 V supply? (2)

PART C

Answer any FOUR questions

(4x12.5=50)

17. With a neat circuit diagram explain the working of inverting and non-inverting amplifiers using OP-AMP.
18. a) Obtain an expression for the radius and electron energy of the n^{th} orbit using Bohr's atom model.

b) Calculate the energy of the electron in the 1st orbit of hydrogen from the following data $e = 1.6 \times 10^{-19} \text{C}$, $m = 9.1 \times 10^{-31} \text{ kg}$, $h = 6.626 \times 10^{-34} \text{ Js}$ and $\epsilon_0 = 8.854 \times 10^{-12} \text{ Fm}^{-1}$.

19. Draw B.E/A versus A curve and hence write the formula to find the binding energy per nucleon of an atom. Explain each term in it.
20. Write short notes on various types of defects in crystals.
21. Describe the Davisson and Germer experiment for the study of electron diffraction and discuss the results.
22. What is photoelectric effect? Explain the working of photo-emissive, photo-voltaic and photo-conductive cells.

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