B.Sc. DEGREE EXAMINATION, APRIL 2018.

I YEAR II SEMESTER

Allied I-PaperII - ALLIED PHYSICS - II

Time : 3 Hours Max. Marks :60

SECTION A – (10 × 1 = 10 marks)

(Q. No. 1-12)Answer any *TEN* questions

1. Define dispersion.
2. Give the principle of interference in thin films.
3. What are coupling scheme?
4. State Pauli's exclusion principle.
5. Define the term Mass defect .
6. Give any two properties of gamma rays.
7. Define temperature of inversion.
8. Give any two practical application of low temperature.
9. Give the logic symbol and truth table of a two input OR gate.
10. Give the rules of boolean algebra of AND gate.
11. What are quantised vectors.
12. What are magic numbers.

SECTION B – (5 × 4 = 20 marks)

(Q. No. 13-19)Answer any *FIVE* questions

1. Explain the formation of interference pattern in wedge shaped film.
2. What are the quantum numbers associated to an electron in an atom. Explain them.
3. Give the analogy between a liquid drop and nucleus as relevant in the liquid drop model of the nucleus.
4. Explain the Linde's process of liquefying a gas with the use of a diagram.
5. State and verify De Morgan's theorems.
6. Calculate the binding energy and binding energy per nucleon of 6C12 nucleus. Given mass of 1 proton = 1.007276 amu. Mass of 1 neutron = 1.008665. Mass of electron = 0.00055amu.Mass of 6C12 nucleus = 12 amu.
7. Prove that *( a) (A+B)(A+C) = A+BC*

 *(b) AC+ABC=AC.*

SECTION C – (3 × 10 = 30 marks)

(Q. No. 20-24)Answer any *THREE* questions

1. Describe how two narrow angled prisms can be combined to produce dispersion without deviation and deviation without dispersion.
2. Explain L.S. coupling and j-j coupling with neat diagram.
3. Explain "Mean life period" and derive an expression for it.
4. What is Joule-Thomson effect? Describe the porous-plug experiment and outline its important results.
5. Show how OR, AND and NOT gates can be realized using NAND and NOR gates.