B.Sc. DEGREE EXAMINATION,NOVEMBER 2018
II Year IV Semester
Allied - paper IV
ALLIED PHYSICS - II

Time : 3 Hours   **Max.marks :60**

Section A $(10 \times 1 = 10)$ Marks

Answer any **TEN** questions

1. A plane transmission grating produces first order diffraction maximum at 19.5^o for light of wavelength 5462 A^o. Calculate the number of lines on the grating per unit length.

2. Write down the uses the air wedge.

3. What is spin quantum number?

4. State Pauli's exclusion principle.

5. The half-life of Zn-71 is 2.4 minutes. If one had 100.0 g at the beginning, how many grams would be left after 7.2 minutes has elapsed?

6. Define mass defect.

7. Write any two applications of low temperature physics.

8. What is a cryogenic engine?

9. State De Morgan's law.

10. Draw NAND gate with truth table

11. Write any two properties of Gamma rays.

12. What is meant by dispersion?

Section B $(5 \times 4 = 20)$ Marks

Answer any **FIVE** questions

13. Explain Combination of two prisms to produce dispersion without deviation

14. Explain L-S and JJ coupling.

15. Discuss mass defect and binding energy of nucleus. How Iron (Fe) exhibit stable nuclear property?

16. Explain porous plug experiment

17. Explain AND, OR and NOT Gate with logical symbols, truth table and Boolean expression.

18. What are alpha, beta and gamma rays?

19. The initial mass of an Iodine isotope was 200g. Determine the Iodine mass after 30 days if the half-life of the isotope is 8 days.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. Describe the experiment with neat sketch to find the diameter of a thin wire using air wedge.

21. Explain Vector atom model in detail.

22. Derive an expression of radioactivity for half life and mean life of a radioactive substance.

23. What are the practical applications of low temperature physics?

24. State and Prove De Morgan's theorem.

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