

## First B.Sc Optometry Degree Examinations - September 2012

**PHYSICS**

Time: 3 hrs

Max marks : 80

- Answer all questions
- Draw diagram wherever necessary

**Essay:****(2x15=30)**

1. What is a zone plate and how it is made. Explain how a zone plate acts like a convergent lens having multiple foci. Derive an expression for its focal length.
2. How would you determine the wavelength of light using Lloyd's mirror. How would you obtain achromatic fringes with this arrangement.

**Short notes****(5x5=25)**

3. State Huygen's principle. Establish the laws of reflection using wave theory of light.
4. Explain the colour of thin film and derive the necessary formula.
5. Explain the principle and working of a Helium – Neon laser
6. Describe a nicol prism. Explain its working and use.
7. What is the maximum number of orders that can be seen using a grating of 6000 lines per cm. Wavelength of light used is 5893A.

**Answer briefly****(10x2=20)**

8. Mention the various members of electromagnetic spectrum in the increasing order of frequency.
9. What is aphakia and how it can be corrected.
10. Explain what is meant by system matrix.
11. Explain third order theory.
12. Distinguish between resolving power and dispersive power of a grating.
13. What is spherical aberration and how it is minimized.
14. What is presbyopia and how it is corrected.
15. Name the cardinal points of a lens system.
16. Explain the working of a Lummer and Brodhum photometer.
17. Raman scattering.

**Fill in the blanks****(5x1=5)**

18. The situation in which the number of atoms in the excited state is greater than that in the lower energy level is called\_\_\_\_\_
19. In the case of wedge shaped film we get \_\_\_\_\_ fringes due to interference of light.
20. In a diffraction grating the points separated by the grating elements are called \_\_\_\_\_
21. When unpolarised light is passed through a tourmaline crystal it absorbs \_\_\_\_\_ completely.
22. \_\_\_\_\_ lamps are used in medicine for skin treatment.

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