**First Year B.Sc Optometry Degree Supplementary Examinations**
**December 2017**

# PHYSICS
## (2010 Scheme)

Time : 3 hrs                                               Max marks : 80

- **Answer all questions**
- **Draw diagram wherever necessary**

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

1. What is spherical aberration and coma. How are they corrected. Explain how will you correct spherical aberration using two plano-convex lenses separated by a distance with a suitable expression. What are aplanatic points.

2. Explain the production of plane polarized, circularly polarized and elliptically polarized light with necessary theory. How are they detected.

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

3. State Huygen's principle. Establish the laws of refraction using wave theory of light.
4. Explain cardinal points.
5. Show that in the case of a wedge shaped film we get straight line fringes. Derive an expression for the fringe width.
6. Explain the working of a ruby laser.
7. Find the angular width of the central bright maximum in the Fraunhofer pattern of a slit of width $12 \times 10^{-7}$m when it is illuminated by monochromatic light of wavelength 600nm.

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

8. Explain Malus law
9. Brewster's window
10. State and explain Lambert's law.
11. What is chromatic aberration and how it is corrected.
12. Explain dispersion without deviation.
13. What is optical activity and define specific rotation.
14. Explain quantum theory of light.
15. Explain first order theory.
16. State Fermat's principle
17. What is presbyopia and how it is corrected.

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

18. Quartz crystal is an example of ……………. rotatory crystal.
19. A zone plate can act like…………….. lens.
20. The phenomenon of interference is shown by transverse waves and ………….. waves.
21. According to ……………. law the tangent of the angle of polarization for a given medium is numerically equal to the refractive index of the medium.
22. In a helium – neon laser, for laser transition, the energy levels are provided by the ………. atoms.

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