

# **2010 Scheme**

**Q.P. Code: 103013 (old scheme)**

**Reg. No.:.....**

## **First Year B.Sc Optometry Degree Supplementary Examinations October 2019**

### **Physics**

**Time: 3 hrs**

**Max marks: 80**

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

#### **Essay:**

**(2x15=30)**

1. In Newton's rings experiment in reflected system, show that the diameter of dark ring is directly proportional to the square root of an integer. Describe the determination of refractive index of water by Newton's rings experimental method.
2. Describe the construction and working of He-Ne laser with reference to energy level diagram. "Achieving population inversion is relatively easy in a four level laser than three level laser". Explain

#### **Short notes**

**(5x5=25)**

3. What are nodal points and nodal planes. Give their properties.
4. Explain the construction and working of a plane transmission grating.
5. Explain dispersion without deviation and deviation without dispersion.
6. Describe the action of Nicol prism as a polariser.
7. Distinguish between step index and graded index optical fibres.

#### **Answer briefly**

**(10x2=20)**

8. Define total internal reflection.
9. Define dextro-rotatory optically active substance. Give an example.
10. Explain Fourier transforming properties of lenses.
11. Explain numerical aperture of an optical fibre.
12. Compare a convex lens and a zone plate.
13. Obtain an expression for the resolving power of a grating.
14. Define term 'viscosity of a fluid'.
15. What is metastable state in a laser. What is its physical significance.
16. What is optical pumping.
17. Rayleigh's scattering

#### **Fill in the blanks**

**(5x1=5)**

18. The principle behind plane transmission grating is .....class of diffraction.
19. Abbe's sign condition is used to reduce.....
20. The interference phenomenon supports .....theory of light..
21. Colours exhibited by thin mica sheet is due to.....
22. The spherical shape of a liquid drop is due to.....

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