

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

**Paper III – Physical & Geometrical Optics**  
**(2016 Scheme)**

**Time: 3 hrs****Max marks: 80**

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

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

1. State Fermat's and Huygens's principles and using them arrive at the laws of reflection and refraction.
2. What is meant by plane and circularly polarized light. Explain Brewster's law and show that when light is incident on a transparent substance at the polarizing angle, the reflected and refracted rays are at right angles. Explain how plane polarized light is produced by reflection and refraction

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

3. Explain image formation by a cylindrical lens.
4. What is chromatic aberration and explain the methods of minimizing it.
5. What is myopia and explain how it can be corrected.
6. An object 3 cm high is placed 20 cm to the left focal length of a convex and "concave" spherical mirror ,each of 10 cm determined position and nature of the image in each case using vergence method
7. Write the grating equation and explain how grating produces spectrum with white light. In any order which end of the spectrum is deviated most

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

8. State Prentice rule.
9. Draw Gullstrand's simplified schematic eye.
10. Explain the term entrance pupil.
11. What is the advantage of reflecting telescope over refracting telescope. Explain.
12. What is meant by ocular astigmatism
13. At what object position the image formed by a concave mirror will be real, inverted and of the same size as the object. Draw the corresponding ray diagram.
14. Describe spontaneous and stimulated emission of radiation.
15. Define principal planes for a thick lens. Draw the necessary ray diagram.
16. What is the deviation produced by an ophthalmic crown glass prism (refractive index=1.523) with a 6° apex angle.
17. Differentiate between phosphorescence and fluorescence

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

18. The unit of radiant intensity is .....
19. The phenomenon of polarization is exhibited by ..... waves.
20. In laser pumping is used to support .....
21. The reflected images from the front and back surfaces of the crystalline lens of the eye are called .....
22. In a compound microscope, the objective lens serves as the ..... stop and ..... pupil of the optical system.

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