First Year B.Sc Optometry Degree Supplementary Examinations April 2018

Physics
(2010 Scheme)

Time: 3 hrs   Max marks: 80

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

Essay: (2x15=30)

1. Explain the construction of a plane transmission grating. Also explain the diffraction in a plane transmission grating and describe how it is used to determine the wavelength of light.
2. Describe the construction of a ruby laser. Also explain the three level mechanism of lasing action in a ruby laser.

Short notes   (5x5=25)

3. Distinguish between Fresnel's and Fraunhofer's class of diffraction
4. Explain the working principle of optical fibres. Derive an expression for numerical aperture.
5. Describe an experimental procedure to test the optical planeness of glass plates.
6. Explain spherical aberration and astigmatism. How do you correct them
7. What is the power of a lens. Calculate the power of two thin lenses of focal lengths f_1 and f_2 separated by distance, d

Answer briefly   (10x2=20)

8. Define optical activity
9. Explain the physical principle behind the 'colours exhibited by thin films'.
10. What is double refraction. Give an example
11. What is zone plate
12. What is grating element. Obtain grating equation
13. What is photovoltaic effect
14. Define simple harmonic motion
15. What is meant by astigmatism
16. Define holography
17. Any three uses of lasers in medical field

Fill in the blanks   (5x1=5)

18. The process in which photon emission occurs without any interaction with external radiations is ……………………………….
19. The mathematical principle behind interference is ……………………… principle
20. Abbe's sine condition is used to reduce ……………………..
21. In an optical fibre the refractive index of core is ………………………… than that of cladding.
22. Spherical shape of a rain drop is due to ……………………

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