

2010 Scheme

Q.P. Code: 103013

Reg. No.:.....

First Year B.Sc Optometry Degree Supplementary Examinations January 2023 Physics

Time: 3 hrs

Max marks: 80

- Answer all questions to the point neatly and legibly • Do not leave any blank pages between answers
- Indicate the question number correctly for the answer in the margin space
- Answer all parts of a single question together • Leave sufficient space between answers
- Draw table/diagrams/flow charts wherever necessary

Essay:

(2x15=30)

1. Explain the interference in wedge shaped films. Derive the expression for bandwidth of interference pattern of air wedge. How can we test the optical flatness of two surfaces using air wedge.
2. Explain in detail the production and detection of plane polarised, circularly polarised, elliptically polarised light. Explain of working of half hade polarimeter.

Short notes

(5x5=25)

3. Define principal plane, optical axis, ordinary ray, extraordinary ray, negative and positive crystals. Draw the diagram of Nicol prism and mark the above mentioned parameters.
4. Distinguish between step index and graded index fibres. Write the expression for numerical aperature of these two type of fibres.
5. What happens to interference pattern in Young's experiment if • one of the slit is closed
• mica sheet is introduced in between one of the slits and screen • experiment is performed under water • distance between slits and screen is increased • If yellow light is replaced by blue light.
6. Explain how population inversion is achieved in He-Ne laser
7. Define • numerical aperature of a fibre • angle of acceptance • acceptance cone • V-number • single mode and multimode propagation.

Answer briefly

(10x2=20)

8. Explain Fourier transformation properties of lenses.
9. Explain the propagation of electromagnetic wave in vacuum using simple equations.
10. Explain nodal slides and nodal points of a lens.
11. Explain meta-stable state in a laser.
12. How a hologram is produced.
13. Explain temporal and spatial coherence.
14. Give four applications of laser in Ophthalmology.
15. Explain specific rotation. Draw the experimental diagram of determination of specific rotation of sugar solution.
16. Explain Raman scattering. What are stokes and anti-stokes lines.
17. Explain nodal slides and nodal points of a lens.

Fill in the blanks

(5x1=5)

18. Colour of rainbow is due to
19. Band width of interference band are
20. Grating spectra is a.....spectrum
21. Velocity of light is maximum in
22. Raman scattering is scattering
