

PG (CBCS)
M.SC. Semester- IV Examination, 2026
PHYSICS
PAPER: PHS 406
(APPLIED OPTICS)



Full Marks: 20

Time: 1 Hours

The figures in the right-hand margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

GROUP-A

Answer any **TWO** of the following questions: 2×2=4

1. A fiber has core index 1.5 and cladding 1.47. Find critical angle.
2. What are the advantages of holography in data storage and imaging?
3. What is multipath broadening?
4. State the conditions for multi photon absorption process to generate higher energetic photons than absorbed photons.

GROUP-B

Answer any **TWO** of the following questions: 2×4=8

5. Calculate acceptance angle if $NA = 0.22$.
6. Compare electronic vs photonic computing systems critically.
7. Deduce the expression for total time delay due to modal dispersion in step index fibre.
8. Explain tristate logic gate operation.

GROUP-C

Answer any **ONE** of the following questions: 1×8=8

9. Discuss future scope of photonics in AI and optical computing. Explain self-focusing and self-defocusing with mathematical condition. 4+4
10. A multimode fiber has diameter $50\ \mu\text{m}$ and $NA = 0.25$. Calculate number of modes. Design a simple holographic setup and justify component selection. 4+4

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