



A Charutar Vidya Mandal's Institution
V.P. & R.P.T.P. SCIENCE COLLEGE

(AUTONOMOUS) (Grant-in-Aid)

Affiliated to Sardar Patel University

VALLABH VIDYANAGAR-388120



Bachelor of Science (Semester 1)

External Examination - 2024

Subject Code : US01MIPHY01

Subject Name: Optics and Laser Applications

Date: 20-11-2024, (WEDNESDAY)

Time: 11:00 AM to 12:30 PM (1.5 HRS.)

Total marks :25

Note: (i) All the symbols have their usual meanings.

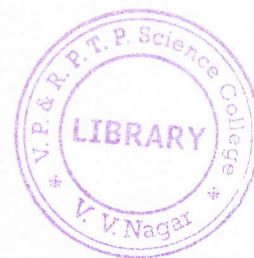
(ii) Figures at the right side of questions indicate full marks.

Que.-1

To answer the MCQs choose the correct option.

[05]

1. The working principle of Jamin's interferometer is based on division of _____.
 (a) amplitude (b) frequency (c) wavelength (d) phase
2. The resolving power of microscope is given by _____.
 (a) $t \frac{d\mu}{d\lambda}$ (b) nN (c) $\frac{1.22\lambda}{2 \sin i}$ (d) $\frac{a}{1.22\lambda}$
3. LASER is an acronym for _____.
 (a) Light Amplification by Spontaneous Emission of Radiation
 (b) Light Amplification by Stimulated Emission of Radiation
 (c) Light Amplification Spurious Emission of Radiation
 (d) Light Amplification by Simulated Emission of Radiation
4. The Nd:YAG laser gives output in _____ region.
 (a) ultraviolet (b) visible (c) infrared (d) microwave
5. _____ is not pumping method for laser.
 (a) optical (b) electrical discharge (c) chemical (d) thermal



Que.-2

- (a) Describe the construction and working of Michelson's interferometer with necessary diagrams. [06]
- (b) Discuss the types of fringes produced by Michelson's interferometer. [04]

OR

Que.-2

- (a) Derive the expression for resolving power of a prism. [06]
- (b) Define resolving power of an optical instrument. Explain the Rayleigh criterion for resolution. [04]

Que.-3

- (a) Discuss CO₂ laser with proper diagrams. [06]
- (b) Enlist the properties of lasers. Explain any two of them. [04]

OR

Que.-3

- (a) Write a note on Nd:YAG laser. [06]
- (b) Which are the methods used for population inversion in laser production? Explain any two of them. [04]

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