



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) Internal Examination - 2024

Subject: Physics Code: US01MIPHY01 Title: Optics and Laser Applications

Date: 4th October 2024, Friday

Time: 11:00 AM to 12:00 Noon

Total marks :20

N.B: All the symbols have their usual meanings.

Q1 To answer the questions choose the most correct option:

[6]

- (1) The modification of intensity of light distribution by the superposition of two or more light beams under certain conditions is called phenomenon of _____.
(a) Refraction (b) Diffraction (c) Polarization (d) Interference
- (2) The working principle of Michelson interferometer is based on division of _____.
(a) Frequency (b) Amplitude (c) Wavelength (d) Wavefront
- (3) In Michelson interferometer, when mirrors M_1 and M_2 are exactly perpendicular, the shape of the fringes will be _____.
(a) Inclined (b) Straight line (c) Circular (d) No fringes
- (4) Laser is an acronym of Light Amplification by _____ of radiation.
(a) Spontaneous Emission (b) Spontaneous Absorption
(c) Stimulated Emission (d) Stimulated Absorption
- (5) To initiate the excitation process in CO_2 laser, _____ gas is mixed in.
(a) Helium (b) Neon (c) Nitrogen (d) Oxygen
- (6) Normally in CD ROM, a laser beam of _____ is used for writing.
(a) 5 mW (b) 5 W (c) 25 mW (d) 25 W

Long answer type questions:

Q2 Explain construction, working and applications of Jamin's refractometer.

[7]

Or

Q2 Derive expressions for the resolving power of a telescope with rectangular and circular apertures.

[7]

Q3 Explain the following radiation processes:

[7]

(a) stimulated absorption (b) spontaneous emission and (c) stimulated emission.

Or

Q3 Write a note on Nd: YAG laser.

[7]