

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

(AUTONOMOUS) (Grant-in-Aid)

Affiliated to Sardar Patel University

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Bachelor of Science (Semester 1) Internal Examination - 2024
Subject: Physics US01IDPHY01 : Laser and Optical Instruments

Date: 5th October 2024, Saturday

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 working principle of Rayleigh's interferometer is based on division of

(a) Frequency	(b) Amplitude
(c) Wavelength	(d) Wavefront
- (2) The criterion of resolution of optical instrument was given by _____

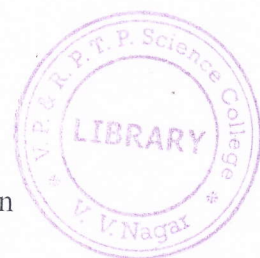
(a) H u y g e n s	(b) Rayleigh	(c) Einstein	(d) Newton
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- (3) In Michelson's interferometer, dark region obtains if the position of M_1 , and M'_2 are _____

(a) Perpendicular	(b) Parallel	(c) Crossed	(d) Overlapping
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- (4) Laser is an acronym of Light Amplification by _____ of radiation.

(a) Stimulated Emission	(b) Stimulated Absorption
(c) Spontaneous Emission	(d) Spontaneous Absorption
- (5) In the population inversion.

(a) $N_1 > N_2$	(b) $N_2 > N_1$	(c) $N_2 \gg N_1$	(d) $N_2 = N_1$
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- (6) Which source of light is brightest?

(a) Sunlight	(b) Arc light	(c) Laser light	(d) Sodium light
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Long answer questions:

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

[7]

Or

Q2 Derive an expression for resolving power of a telescope.

[7]

Q3 Explain stimulated absorption, spontaneous emission, and stimulated radiation processes.

[7]

Or

Q3 What are the properties of LASER?

[7]