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Courses » Laser Fundamentals and Applications

Announcements

Course

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Unit 8 - Week 7 – Applications of Lasers: Non-linear optics, LIDAR, Laser spectroscopy, Isotope enrichment and separation.

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Course outline

How to access the portal

Week 1 - Introduction to LASERS

Week 2 - Concept of population inversion, 2-level, 3-level, and 4-level systems, Components of LASERS

Week 3 - Threshold condition, Unique Properties of LASER, various parameters of a LASER

Week 4 - Pulsing techniques

Week 5 - Mode-Locking technique and types of LASER

Assignment 7

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment. **Due on 2019-03-20, 23:59 IST.**

1) The Sum Frequency Generation of two laser lights of wavelengths 840 nm and 650 nm will **1 point** appear at ____

- 366 nm
- 387 nm
- 355 nm
- 455 nm

No, the answer is incorrect.

Score: 0

Accepted Answers:

366 nm

2) Which of the following change will affect the SHG signal? **1 point**

- Increasing incident power
- Choosing material with larger second order susceptibility
- Choosing longer crystal
- All of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

All of the above

3) What is the value of 4th order susceptibility for a centrosymmetric molecule? **1 point**

- 0.5

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Applications of Lasers: Non-linear optics, LIDAR, Laser spectroscopy, Isotope enrichment and separation.

- Lecture 31- Non-linear optical processes
- Lecture 32 - Aspects of SHG and Application of non-linear optics
- Lecture 33 - Application of LASER: LIDAR
- Lecture 34 - Application of Laser: Laser Spectroscopy
- Lecture 35 - Application of Laser: Enrichment of Isotope

- Quiz : Assignment 7
- Feedback For Week 7
- Solution for Assignment -7

Week 8 - Various Applications of Lasers, Laser safety and Summary

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Accepted Answers:

0

4) What is the phase matching condition for SHG wave generation if ω_1 is the frequency of the **1 point** fundamental light and 'n' represents the refractive index?

- $n(2\omega_1) > n(\omega_1)$
- $n(2\omega_1) < n(\omega_1)$
- $n(2\omega_1) = n(\omega_1)$
- $2n(2\omega_1) = n(\omega_1)$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$n(2\omega_1) = n(\omega_1)$

5) Which of the following technique is used to measure width of an ultrashort laser pulse? **1 point**

- Autocorrelation
- LIDAR
- CARS
- Raman amplification

No, the answer is incorrect.

Score: 0

Accepted Answers:

Autocorrelation

6) What is the effective path length (in cm) for a wave ($\lambda = 532$ nm) in a multipass cell, if the cell length is 1 cm and number of round trips = 10^3 ? **1 point**

- 1×10^3
- 2×10^3
- 3×10^3
- 532×10^3

No, the answer is incorrect.

Score: 0

Accepted Answers:

2×10^3

7) Which of the following method is used to measure distance of a particular analyte present at far? **1 point**

- Raman amplification
- CARS
- Autocorrelation
- LIDAR

No, the answer is incorrect.

Score: 0

Accepted Answers:

LIDAR

8) The Third Harmonic of wave ($\lambda = 1059$ nm) will appear at _____ **1 point**

- 529 nm
- 550 nm



353 nm

253 nm

No, the answer is incorrect.

Score: 0

Accepted Answers:

353 nm

9) Which of the following is correct for Raman spectroscopy

1 pt

- Anti-Stokes lines always have higher intensity compared to stokes line
- Anti-Stokes lines have higher frequency than Rayleigh line
- Stokes line has higher frequency than Rayleigh line
- All of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

Anti-Stokes lines have higher frequency than Rayleigh line

10) Selective photoionization' method for laser assisted isotope separation is based upon

1 point

- Isotopes have similar chemical behavior
- Isotopes have different atomic masses
- Isotopes have same number of protons
- Excited states of isotopes have different life time

No, the answer is incorrect.

Score: 0

Accepted Answers:

Excited states of isotopes have different life time

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