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Courses » Laser Fundamentals and Applications

Announcements **Course** Ask a Question Progress FAQ



Unit 4 - Week 3 - Threshold condition, Unique Properties of LASER, various parameters of a LASER

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Certification exam

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

- Lecture 11 - Threshold Condition
- Lecture 12 - Properties of Laser: Directionality

Assignment 3

The due date for submitting this assignment has passed.
As per our records you have not submitted this **Due on 2019-02-20, 23:59 IST.**
assignment.

1) What is the gap in frequency (in MHz) between two longitudinal modes in a linear cavity whose optic length, $L = 450 \text{ mm}$? (1MHz= 10^6 Hz) **1 point**

- 154.3
- 333.3
- 222.3
- 584.6

No, the answer is incorrect.
Score: 0

Accepted Answers:
333.3

2) If the intensity at the center of a LASER beam (TEM_{00} mode) is 10 unit, then what will be intensity at the radius of the beam? **1 point**

- 5.00 unit
- 2.35 unit
- 1.35 unit
- 5.40 unit

No, the answer is incorrect.
Score: 0

Accepted Answers:
1.35 unit

3) If a laser beam of wavelength 450 nm has a divergence (θ) = 20° . Find out the beam waist. **1 point**

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Lecture 15 - Some Numerical problem

Quiz : Assignment 3

Feedback For Week 3

Solution for assignment - 3

Week 4 - Pulsing techniques

Week 5 - Mode-Locking technique and types of LASER

Week 6 - Types of LASERs and Non Linear Optics

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

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

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Score: 0

Accepted Answers:

$0.82 \mu\text{m}$

4) If $\Delta\lambda$ is the emission line width of a LASER output then the coherence time is given by **1 point**

$1/\Delta\lambda$

$c/\Delta\lambda$

$c/\Delta\lambda^2$

$hc/\Delta\lambda$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$1/\Delta\lambda$

5) Calculate the coherence length for a beam travelling in glass (RI=1.5) medium for which the bandwidth is 2500 MHz. (1MHz= 10^6 Hz) **1 point**

0.10 cm

10.00 cm

0.08 cm

8.00 cm

No, the answer is incorrect.

Score: 0

Accepted Answers:

8.00 cm

6) Calculate the Q factor of a LASER with central wavelength of 500 nm and bandwidth of 2.5GHz. (1GHz= 10^9 Hz) **1 point**

4.89×10^5

2.40×10^5

4.44×10^5

9.45×10^5

No, the answer is incorrect.

Score: 0

Accepted Answers:

2.40×10^5

7) Calculate number of longitudinal modes that can oscillate in a cavity of length 150 cm. Bandwidth is 10 GHz. (1GHz= 10^9 Hz) **1 point**

10

100

1000

200

No, the answer is incorrect.

Score: 0

Accepted Answers:

100

8) Calculate the peak power(P_{peak}) of a LASER if $P_{\text{avg}} = 3.5 \text{ W}$ pulse and width is 100 ns with a repetition rate of 80KHz. (1KHz= 10^3 Hz) **1 point**



- 515.8 W
- 655.2 W
- 437.5 W
- 352.6 W

No, the answer is incorrect.

Score: 0

Accepted Answers:

437.5 W

9) Calculate the P_{avg} of a LASER if $P_{peak} = 600$ W and pulse width is 85 ns with a repetition rate of 100 KHz. (1KHz= 10^3 Hz) **1 point**

- 3.2 W
- 5.4 W
- 8.5 W
- 5.1 W

No, the answer is incorrect.

Score: 0

Accepted Answers:

5.1 W

10) If a light beam of wavelength 500 nm has a beam waist = 1.5 μ m, find out the divergence (θ). **1 point**

- 12°
- 15°
- 10°
- 18°

No, the answer is incorrect.

Score: 0

Accepted Answers:

12°



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