

# Unit 4 - Dispersion Effects and Transverse Electromagnetic Mode

## Course outline

### How to access the portal?

### Introduction and Mathematical Representation

### Nonlinear Effects

### Dispersion Effects and Transverse Electromagnetic Mode

#### ● Dispersion Effects

#### ● Nonlinear and Dispersion Effects (Continued..)

#### ● Nonlinear and Dispersion Effects (Continued..)

#### ● Transverse Electromagnetic Mode

#### ● Transverse Electromagnetic Mode (Continued..)

#### ○ Quiz : New Assessment week 3

### Construction of Ultrafast Laser and Measurement of Pulses

### Measurement Techniques in Ultrafast Spectroscopy, and their kinetic and quantum mechanical models

### Ultrafast Processes in Physical Chemistry – Photophysics, Photochemistry, Solid State, Transition Metal Complexes and Biomolecules

### Maxwell's Equations

### Ab Initio Molecular Dynamics of Photochemistry and Photophysics – Part 1

### Ab Initio Molecular Dynamics of Photochemistry and Photophysics – Part 2

### Attosecond Chemical Dynamics – Theoretical Point of View

### Attosecond Chemical Dynamics – Experimental Point of View

### Femtochemistry of Nanocatalysis

## New Assessment week 3

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

**Due on 2019-08-21, 23:59 IST.**

1) When light propagates through an absorbing medium

1 point

- intensity drops linearly as a function of optical path length
- intensity drops exponentially as a function of optical path length
- intensity increases linearly as a function of optical path length
- intensity increases exponentially as function of optical path length

No, the answer is incorrect.

Score: 0

Accepted Answers:

*intensity drops exponentially as a function of optical path length*

2) If you make an attempt to view a 100 fs optical pulse is using an oscilloscope and a photodiode, what would you see in oscilloscope:

1 point

- a 100 fs pulse
- a 100 ps pulse
- a 10 fs pulse
- a 10 ns pulse

No, the answer is incorrect.

Score: 0

Accepted Answers:

*a 10 ns pulse*

3) When light propagates through a lasing medium

1 point

- intensity drops linearly as a function of optical path length
- intensity drops exponentially as a function of optical path length
- intensity increases linearly as a function of optical path length
- intensity increases exponentially as function of optical path length

No, the answer is incorrect.

Score: 0

Accepted Answers:

*intensity increases exponentially as function of optical path length*

4) If you make an attempt to view a 100 fs optical pulse is using an oscilloscope and a photodiode, what would you see in oscilloscope:

1 point

- a 100 fs pulse
- a 100 ps pulse
- a 10 fs pulse
- a 10 ns pulse

No, the answer is incorrect.

Score: 0

Accepted Answers:

*a 10 ns pulse*

5) Population inversion can be achieved for

1 point

- two level system
- one level system
- any system
- four level system

No, the answer is incorrect.

Score: 0

Accepted Answers:

*four level system*

6) Longitudinal modes are those  $\lambda$ s which sustain in a cavity of length  $L$ , where

1 point

- $\lambda=2L/m$  Invalid HTML tag: tag name o:p is not allowed
- $\lambda=L/m$  Invalid HTML tag: tag name o:p is not allowed
- $\lambda=L$  Invalid HTML tag: tag name o:p is not allowed
- $\lambda=2L$  Invalid HTML tag: tag name o:p is not allowed

No, the answer is incorrect.

Score: 0

Accepted Answers:

*$\lambda=2L/m$  Invalid HTML tag: tag name o:p is not allowed*

7) Due to optical Kerr effect,

1 point

- Refractive index depends on wavelength
- Refractive index depends on intensity
- Refractive index becomes greater than 1
- Refractive index becomes less than 1.

No, the answer is incorrect.

Score: 0

Accepted Answers:

*Refractive index depends on intensity*

8) CPA scheme to create a short pulse includes

1 point

- compressed-pulse-amplification
- stretch-amplify-compres
- directly amplif
- stretch-amplify

No, the answer is incorrect.

Score: 0

Accepted Answers:

*stretch-amplify-compres*

9) Deconvolution factor for an autocorrelation measurement of a Gaussian pulse is

1 point

- 1.32
- 1.22
- 1.41
- 0.44

No, the answer is incorrect.

Score: 0

Accepted Answers:

*1.41*

10) In a FROG measurement, which detector do you need?

1 point

- a spectrometer
- a photodiode
- a PMT
- a CCD camer

No, the answer is incorrect.

Score: 0

Accepted Answers:

*a spectrometer*

11) In an autocorrelation measurement, which detector do you need?

1 point

- a spectrometer
- a photodiode
- a PMT
- either option (b) or (c).

No, the answer is incorrect.

Score: 0

Accepted Answers:

*either option (b) or (c).*