Unit 7 - Ultrafast Processes in Physical Chemistry – Photophysics, Photochemistry, Solid State, Transition Metal Complexes and Biomolecules

Course outline

How to access the portal?

Introduction and Mathematical Representation

Nonlinear Effects

Dispersion Effects and Transverse Electromagnetic Mode

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

- Ultrafast Physical Chemistry: Photophysics and Photochemistry
- Ultrafast Physical Chemistry: Solid State
- Ultrafast Physical Chemistry: Transition Metal Complexes and Biomolecules
- Quiz : Assessment week 6

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

Assessment week 6

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

Due on 2019-09-11, 23:59 IST.

1) In Vacuum, divergence of electric and magnetic field: *1 point*

- cannot be determined
- is zero
- does not depend on the volume charge density
- depends on volume charge density

No, the answer is incorrect.
Score: 0
Accepted Answers:
is zero

2) For a plane wave, magnitude of wave vector is *1 point*

- proportional to the wavelength
- inversely proportional to the wavelength
- proportional to the square of wavelength
- inversely proportional to the square of wavelength

No, the answer is incorrect.
Score: 0
Accepted Answers:
inversely proportional to the wavelength

3) A plane wave propagating along +z direction is represented by *1 point*

- $E=E_0\cos(\omega_0 t+k_0 z)$
- $E=E_0\cos(\omega_0 t)$
- $E=E_0\cos(-\omega_0 t)$
- $E=E_0\cos(\omega_0 t-k_0 z)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$E=E_0\cos(\omega_0 t-k_0 z)$

4) In a dielectric medium, divergence of magnetic field: *1 point*

- cannot be determined
- is zero
- does not depend on the volume charge density
- depends on volume charge density

No, the answer is incorrect.
Score: 0
Accepted Answers:
is zero

5) SVEA approximation suggests that *1 point*

- variation of the envelope function is slower than the carrier wave
- a slowly propagating pulse
- variation of the carrier wave is slower than the envelope function
- none of above

No, the answer is incorrect.
Score: 0
Accepted Answers:
variation of the envelope function is slower than the carrier wave

6) Phase-matching can be achieved in a *1 point*

- birefringent crystal
- gas medium
- in any medium
- in liquid only

No, the answer is incorrect.
Score: 0
Accepted Answers:
birefringent crystal

7) Phase-matching bandwidth is *1 point*

- proportional to the nonlinear medium's thickness
- proportional to the nonlinear medium's refractive index
- inversely proportional to the nonlinear medium's thickness
- proportional to the nonlinear medium's absorption

No, the answer is incorrect.
Score: 0
Accepted Answers:
inversely proportional to the nonlinear medium's thickness

8) Which one of the following is true in a dispersive medium: *1 point*

- red light travels faster than blue light
- blue light travels faster than red light
- red and blue light travels with equal velocity
- Green light travels faster than red light

No, the answer is incorrect.
Score: 0
Accepted Answers:
red light travels faster than blue light

9) In a birefringent crystal, ordinary and extraordinary rays experience *1 point*

- the same refractive index
- different refractive index
- different direction of reflection
- all above

No, the answer is incorrect.
Score: 0
Accepted Answers:
different refractive index

10) Maximum of $Sinc^2(x)$ function appears at *1 point*

- $x=0$
- $x=+\infty$
- $x=-\infty$
- limit $x\to 0$

No, the answer is incorrect.
Score: 0
Accepted Answers:
limit $x\to 0$

You were allowed to submit this assignment only once.