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Courses » Introduction to Non-linear Optics and its Applications

Announcements **Course** Ask a Question Progress Mentor FAQ**Unit 14 - Week 12****Course outline**

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Pre-requisite Assignment

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Week 12

 Lecture 56 : Raman Amplification Lecture 57 : Raman Amplification (Cont) Lecture 58 : Linear pulse propagation Lecture 59 : Nonlinear Pulse propagation Lecture 60 : Optical Soliton Quiz : Week 12 Assignment 12

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Assignment Solution

Week 12 Assignment 12The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.**Due on 2018-10-24, 23:59 IST.**1) 2 points

If a Gaussian pulse is launched into a dispersive system the temporal distribution of pulse will

(a) Shrink (b) Broaden (c) remain intact

- (a)
- (b)
- (c)

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

(b)

2) 2 points

The spectral broadening phenomenon takes place in presence of

(a) Dispersion (b) Nonlinearity (c) none of these

- (a)
- (b)
- (c)

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

(b)

3) 2 pointsFor a Gaussian pulse of temporal distribution $U(0, T) = \exp - \left(\frac{T^2}{2T_0^2} \right)$ in presence only GVD, the temporal width modifies after a distance z as $(L_D = T_0^2 / |\beta_2|)$,(a) $T_0 \left[1 - \left(\frac{z}{L_D} \right)^2 \right]^{\frac{1}{2}}$ (b) $T_0 \left[1 + \left(\frac{2z}{L_D} \right)^2 \right]^{\frac{1}{2}}$ (c) $T_0 \left[1 + \left(\frac{z}{L_D} \right)^2 \right]^{\frac{1}{2}}$

- (a)
- (b)

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4) 2 points
 For an input Gaussian pulse of width 100 ps what will be the width of output pulse propagating a distance $z = 3L_d$ in a dispersive optical medium
 (a) 316.2 ps (b) 100 ps (c) 223.6 ps (d) 50 ps

- (a)
 (b)
 (c)
 (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(a)

5) 2 points
 The dispersive length of a pulse of width 50 fs in a dispersive medium with β_2 parameter ($\beta_2 = -0.2 \text{ ps}^2/\text{m}$) is
 (a) 1.25 m (b) 1.25 cm (c) 12.5 cm (d) 125 cm

- (a)
 (b)
 (c)
 (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

6) 2 points
 The nonlinear length of a 25 fs pulse of a pulse of power 50 mW and wavelength 1550 nm in a nonlinear optical medium of effective area $0.51 \mu\text{m}^2$ is, ($n_2 = 10^{-18} \text{ m}^2\text{W}^{-1}$)
 (a) 83 m (b) 0.83 cm (c) 83 cm (d) 0.83 mm

- (a)
 (b)
 (c)
 (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(c)

7) 2 points
 The ratio of the nonlinear length to the dispersion length for the pulse described in (6) is approximately ($\beta_2 = 0.075 \text{ ps}^2/\text{m}$;)
 (a) 10 (b) 100 (c) 1 (d) 0.1

- (a)
 (b)
 (c)
 (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

8)

2 points

For a fundamental optical soliton the relation between nonlinear length (L_{NL}) dispersion length L_D is

- (a) $L_D > L_{NL}$ (b) $L_D < L_{NL}$ (c) $L_D = L_{NL}$ (d) $L_D \gg L_{NL}$

- (a)
 (b)
 (c)
 (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(c)

9)

2 points

If $L_D = 4L_{NL}$ then the order (N) of the generated optical soliton is

- (a) 1 (b) 4 (c) 0.5 (d) 2

- (a)
 (b)
 (c)
 (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(d)

10)

2 points

The form ($u(\xi, \tau)$) for a dark soliton in a nonlinear medium is

- (a) $Sech(\tau)e^{\frac{i\xi}{2}}$ (b) $tanh(\tau)e^{\frac{i\xi}{2}}$ (c) $Sin h(\tau)e^{\frac{i\xi}{2}}$ (d) $Sech(\tau) tanh(\tau)e^{\frac{i\xi}{2}}$

- (a)
 (b)
 (c)
 (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

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