Unit 14 - Week 12

Week 12 Assignment 12

The due date for submitting this assignment has passed. Due on 2018-10-24, 23:59 IST.

As per our records you have not submitted this assignment.

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

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

No, the answer is incorrect.
Score: 0
Accepted Answers: (b)

2) The spectral broadening phenomenon takes place in presence of

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

No, the answer is incorrect.
Score: 0
Accepted Answers: (b)

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

(a) \( T_0 \left[ 1 - \left( \frac{z}{L_D} \right)^2 \right]^{1/2} \)  (b) \( T_0 \left[ 1 + \left( \frac{z}{L_D} \right)^2 \right]^{1/2} \)  (c) \( T_0 \left[ 1 + \left( \frac{z}{L_D} \right)^2 \right]^{1/2} \)

No, the answer is incorrect.
Score: 0
Accepted Answers: (b)
4) 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

No, the answer is incorrect.
Score: 0
Accepted Answers: (a)

5) The dispersive length of a pulse of width 50 fs in a dispersive medium with 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

No, the answer is incorrect.
Score: 0
Accepted Answers: (b)

6) 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 $\mu m^2$ is, ($n_2 = 10^{-18} m^2 W^{-1}$)

(a) 83 m  
(b) 0.83 cm  
(c) 83 cm  
(d) 0.83 mm

No, the answer is incorrect.
Score: 0
Accepted Answers: (c)

7) The ratio of the nonlinear length to the dispersion length for the pulse described in (a) is approximately ($\beta_2 = 0.075 \text{ ps}^2/\text{m}$)

(a) 10  
(b) 100  
(c) 1  
(d) 0.1
8) For a fundamental optical soliton the relation between nonlinear length \( L_{NL} \) and dispersion length \( L_D \) is

\[
\begin{align*}
(a) & \quad L_D > L_{NL} \\
(b) & \quad L_D < L_{NL} \\
(c) & \quad L_D = L_{NL} \\
(d) & \quad L_D \gg L_{NL}
\end{align*}
\]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(b)

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

\[
\begin{align*}
(a) & \quad 1 \\
(b) & \quad 4 \\
(c) & \quad 0.5 \\
(d) & \quad 2
\end{align*}
\]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(c)

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

\[
\begin{align*}
(a) & \quad \text{Sech}(\tau) e^{\frac{i\zeta}{2}} \\
(b) & \quad \tanh(\tau) e^{\frac{i\zeta}{2}} \\
(c) & \quad \sin h(\tau) e^{\frac{i\zeta}{2}} \\
(d) & \quad \text{Sech}(\tau) \tanh(\tau) e^{\frac{i\zeta}{2}}
\end{align*}
\]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(b)