Unit 9 - Week 6 Lectures

Assignment-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) Which of the following statements is true for chirped Gaussian pulses (β_2 = Dispersion coefficient, C = Chirping parameter) *1 point*

- When $\beta_2 C < 0$, pulse width of a chirped Gaussian pulse decreases with distance monotonically.
- When $\beta_2 C < 0$, pulse width of a chirped Gaussian pulse increases with distance monotonically.
- When $\beta_2 C < 0$, pulse width of a chirped Gaussian pulse first decreases for a certain distance and then goes on increasing.
- When $\beta_2 C < 0$, pulse width of a chirped Gaussian pulse first increases for a certain distance and then goes on decreasing.

No, the answer is incorrect.
Score: 0
Accepted Answers:
When $\beta_2 C < 0$, pulse width of a chirped Gaussian pulse first decreases for a certain distance and then goes on increasing.

2) When $\beta_2 C > 0$, chirped Gaussian pulse broadens monotonically with distance at a rate slower than that of the unchirped pulse. *1 point*

- True
- False

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

3) A 50 km single mode fiber has $D = 10\ ps/nm - km$ for $\lambda = 1550\ nm$. Assuming that the dispersion varies linearly with wavelength, if the dispersion slope for the fiber is 0.045 $ps/nm^2/km$, the zero-dispersion wavelength for the fiber is *1 point*

- 1327.7 nm
- 1772.2 nm
- 1560 nm
- 1490 nm

No, the answer is incorrect.
Score: 0
Accepted Answers:
1327.7 nm

4) The value of dispersion coefficient (β_2) for the fiber given in Question 3 is *1 point*

- $-6.37\ ps^2/km$
- $-12.74\ ps^2/km$
- $-10\ ps^2/km$
- $-8.2\ ps^2/km$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$-12.74\ ps^2/km$

5) A Gaussian pulse is launched into a transmission fiber (TF) of length 40 km having dispersion coefficient of $-12\ ps^2/km$. The TF is followed by a dispersion compensation fiber (DCF) having dispersion coefficient of 24 ps^2/km. The length of the DCF such that the pulse width of the pulse at the input of the TF is same as that at the output of the DCF is *1 point*

- 80 km
- 120 km
- 20 km
- 30 km

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

6) In Question 5, if the power launched into the transmission fiber is 2 mW and the loss coefficients of TF and DCF are 0.2 dB/km and 0.4 dB/km respectively, the power at the output of the DCF is (ignore the splice loss between TF and DCF) *1 point*

- 0.1 mW
- 0.05 mW
- 1.4 mW
- 0.6 mW

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

7) If an optical signal of bandwidth 10 GHz is launched into the fiber given in Question 3, the delay between the highest and lowest frequency components is *1 point*

- 10.77 ps
- 32.03 ps
- 20 ps
- 40.04 ps

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

8) Graded index optical fibers cause less dispersion-induced pulse broadening than the step index optical fibers. *1 point*

- True
- False

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

9) In a birefringent crystal, *1 point*

- $n_x = n_y$
- $n_x \neq n_y$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$n_x \neq n_y$

10) In a graded index optical fiber ($\alpha = 2$) having V = 10, the total number of guided modes is *1 point*

- 50
- 75
- 25
- 10

No, the answer is incorrect.
Score: 0
Accepted Answers:
25