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Unit 14 - OFC-Week 12 lectures

ASSIGNMENT-12

The due date for submitting this assignment has passed. **Due on 2016-10-11, 23:59 IST.**

Submitted assignment

1) *3 points*

The Kerr coefficient of a single-mode fiber is $2.5 \times 10^{-20}\ m^2/$ W. effective area is $80\mu m^2$. Find the nonlinear coefficient γ at t wavelength 1550 nm

- (•) $1.26 * 10^{-3}\ W^{-1}\ m^{-1}$
- ( ) $0.63 * 10^{-3}\ W^{-1}\ m^{-1}$
- ( ) $2.52 * 10^{-3}\ W^{-1}\ m^{-1}$
- ( ) None of these

Yes, the answer is correct.
Score: 1

Accepted Answers:
$1.26 * 10^{-3}\ W^{-1}\ m^{-1}$

2) *3 points*

In a 1000-km fiber-optic link, it is desired that the peak nonlinear pha shift accumulated over the link should be less than 0.5 rad. The syst has the following parameters: loss coefficient $\alpha = 0.046\ km^{-1}$ amplifier spacing = 100 km, Kerr coefficient $n_2 = 2.5 \times 10^{-20}\ m^2/$ $\lambda_0 = 1550$ nm, and peak power at the fiber input= 0 dBm. Find the lov limit on the effective area of the fiber. Ignore β_2.

- ( ) $21.81\ \mu m^2$
- ( ) $43.61\ \mu m^2$
- ( ) $86.61\ \mu m^2$
- (•) $8.61\ \mu m^2$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$43.61\ \mu m^2$

3) In the above question, the total No. of spans is

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) 10

3 points

4) *3 points*

The FWHM of a fundamental soliton is 50 ps.
Fiber dispersion coefficient $\beta_2 = -21\ ps^2/\text{km}$,
and nonlinear coefficient $\gamma = 1.1\ W^{-1}\ m^{-1}$
The peak power required to form a soliton is (Ignore fiber loss)

- (•) 2.3 mW
- ( ) 9.2 mW
- ( ) 4.6 mW
- ( ) None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
4.6 mW

5) *3 points*

A rectangular pulse of peak power 2mW and pulse width 25 ps transmitted over a periodically amplified dispersion-free fiber-o transmission system operating at 1550 nm. The fiber-optic link cons of 20 amplifiers with an amplifier spacing of 80 km. The parameters the link are as follows: nonlinear coefficient $\gamma = 1.1\ W^{-1}\ m^{-1}$, l coefficient $\alpha = 0.046\ km^{-1}$ spontaneous emission factor $n_{sp} = 1.5$.
The variance of linear phase noise is

- (•) $2.5 \times 10^{-3}\ rad^2$
- ( ) $1.5 \times 10^{-3}\ rad^2$
- ( ) $3.5 \times 10^{-3}\ rad^2$
- ( ) $4.5 \times 10^{-3}\ rad^2$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$1.5 \times 10^{-3}\ rad^2$

6) *3 points*

In the above question, the variance of nonlinear phase noise at receiver is

- ( ) $2.6 \times 10^{-3}\ rad^2$
- ( ) $1.6 \times 10^{-3}\ rad^2$
- (•) $3.6 \times 10^{-3}\ rad^2$
- ( ) $4.6 \times 10^{-3}\ rad^2$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$1.6 \times 10^{-3}\ rad^2$

7) In question no 5. The total variance is *2 points*

- ( ) $5.1 \times 10^{-3}\ rad^2$

- $3.1 \times 10^{-3}\ rad^2$
- $7.1 \times 10^{-3}\ rad^2$
- $9.1 \times 10^{-3}\ rad^2$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$3.1 \times 10^{-3}\ rad^2$

8)

The nonlinear coefficient of a single-mode fiber is 1.1 $W^{-1}\ m^{-1}$. T effective area is (in μm^2)
(Assume $n_2 = 2.5 \times 10^{-20}\ m^2$/W and wavelength = 1530 nm)

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NOTE:Answer must be in integer form

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) 85

2 points

9)

In a 10-Gb/s fiber-optic system based on BPSK operating at 1530 n there are N_a in-line amplifiers with a noise figure of 4.5 dB. Nl rectangular pulses are used with a mean power of 0 dBm. The fil parameters are as follows: $\gamma = 1.1\ W^{-1}\ m^{-1}$, loss coefficient $\alpha = 0.0$ km^{-1} and . The variances of linear and nonlinear phase noises at t fiber output are found to be $2.27 \times 10^{-3}\ rad^2$ and $3.98 \times 10^{-3}\ rad^2$ respectively. The amplifier spacing is (in km)
Ignore dispersion.

NOTE:Answer must be in integer form

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) 100

3 points

Previous Page End