Unit 8 - Week 5 Lectures

Assignment-5

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

Due on 2019-09-04, 23:59 IST.

1) The LP_{12} fiber mode is a combination of *1 point*

- $TE_{01}, TM_{01}, HE_{21}$ modes
- EH_{11}, HE_{31} modes
- $TE_{02}, TM_{02}, HE_{22}$ modes
- $TE_{01}, TM_{01}, HE_{22}$ modes

No, the answer is incorrect.
Score: 0
Accepted Answers:
$TE_{02}, TM_{02}, HE_{22}$ modes

2) A fiber of length 100 km has loss coefficient of 0.046 km^{-1}. The total loss in the fiber is *1 point*

- 4.60 dB
- 19.97 dB
- 6.62 dB
- 16 dB

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

3) If 4 dBm power is launched in the fiber given in Question 1, the output power is *1 point*

- 0.025 mW
- 0.2 mW
- 0.012 mW
- 0.6 mW

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

4) If a photo-detector which can detect minimum power of -13 dBm is used at the fiber output and a pulse having launch power of 4 dBm is launched in the fiber having loss coefficient 0.046 km^{-1}, to detect the input pulse the fiber can have maximum length of *1 point*

- 85.1 km
- 140.2 km
- 35 km
- 100 km

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

5) Intramodal dispersion occurs in fibers because of *1 point*

- Different time taken by different rays passing through the fiber.
- Power attenuation in the fiber.
- Different frequency components passing through the fiber experiencing different amounts of delay.

No, the answer is incorrect.
Score: 0
Accepted Answers:
Different frequency components passing through the fiber experiencing different amounts of delay.

6) If a pulse $p(0,t)$ is launched in a fiber, the Fourier transform of the pulse ($P(z,\omega)$) in the fiber at any location (z) is given by *1 point*

- $P(z,\omega) = P(0,\omega)e^{-j\beta_2\omega^2 z}$
- $P(z,\omega) = P(0,\omega)e^{-j\beta_2\omega z}$
- $P(z,\omega) = P(0,\omega)e^{\frac{-j\beta_2\omega z}{2}}$
- $P(z,\omega) = P(0,\omega)e^{\frac{-j\beta_2\omega^2 z}{2}}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$P(z,\omega) = P(0,\omega)e^{\frac{-j\beta_2\omega^2 z}{2}}$

7) If a Gaussian pulse having pulse width (FWHM) of 8 ps is launched in the fiber having dispersion coefficient $\beta_2 = 10\ ps^2/km$, the pulse width (FWHM) of the pulse at the dispersion length of the fiber will be *1 point*

- 11.31 ps
- 13.70 ps
- 16 ps
- 13.32 ps

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

8) The dispersion length of the fiber given in Question 1 is *1 point*

- 6.4 km
- 3.35 km
- 3.84 km
- 2.30 km

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

9) A Gaussian pulse is launched in a long single-mode fiber with dispersion coefficient $\beta_2 = 10\ ps^2/km$, the input and output pulse widths (FWHM) are 8 ps and 24 ps, respectively. The fiber length is *1 point*

- 8.91 km
- 18.10 km
- 6.53 km
- 6.92 km

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

10) If a chirped Gaussian pulse $U(0,t) = exp\left(-\frac{(1+jC)T^2}{2T_0^2}\right)$ is launched in a fiber of length L having dispersion coefficient β_2. The equation of the pulse at the fiber output is *1 point*

- $\frac{T_0}{[T_0^2 - j\beta_2 L(1+jC)]^{1/2}} exp\left(-\frac{(1+jC)T^2}{2[T_0^2 - j\beta_2 L(1+jC)]}\right)$
- $\frac{T_0}{[T_0^2 - j\beta_2 L(1+jC)]^{1/2}} exp\left(-\frac{(1+jC)T^2}{2T_0^2}\right)$
- $\frac{\pi T_0}{[T_0^2 - j\beta_2 L(1+jC)]^{1/2}} exp\left(-\frac{T^2}{[T_0^2 - j\beta_2 L(1+jC)]}\right)$
- $\frac{T_0}{[j\beta_2 L(1+jC)]^{1/2}} exp\left(-\frac{(1+jC)T^2}{2[T_0^2 - j\beta_2 L(1+jC)]}\right)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\frac{T_0}{[T_0^2 - j\beta_2 L(1+jC)]^{1/2}} exp\left(-\frac{(1+jC)T^2}{2[T_0^2 - j\beta_2 L(1+jC)]}\right)$