Unit 3 - Week 2

Assignment 2

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

Due on 2020-02-12, 23:59 IST.

1) Which one is true for an elliptically polarized wave? (Given: a and b are constants; $a \neq b$) *1 point*

- $E_x = a\cos\omega t,\ E_y = a\cos\omega t$
- $E_x = a\sin\omega t,\ E_y = a\cos\omega t$
- $E_x = b\sin\omega t,\ E_y = a\sin\omega t$
- $E_x = a\cos\omega t,\ E_y = b\sin\omega t$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$E_x = a\cos\omega t,\ E_y = b\sin\omega t$

2) If the fiber loss in a link is 10 dB, then what would be the output power (dBm) for 25 dBm input power? *1 point*

- -10 dBm
- 10 dBm
- 15 dBm
- -20 dBm

No, the answer is incorrect.
Score: 0

Accepted Answers:
15 dBm

3) Attenuation coefficient due to Rayleigh scattering in fused silica glass fiber at wavelength 1.55 μm will be (given $\alpha_0 = 1.7\ dB/km,\ \lambda_0 = 850\ nm$) *1 point*

- 0.07 dB/km
- 0.15 dB/km
- 0.52 dB/km
- 0.95 dB/km

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.15 dB/km

4) An electromagnetic wave is propagating in free space in z-direction. if the electric field is given by $\vec{E} = A\cos(\omega t - kz)\,\hat{x}$, where $\omega = ck$ then the corresponding magnetic field is given by *1 point*

- $\vec{B} = -Ac\cos(\omega t - kz)\,\hat{y}$
- $\vec{B} = Ac\cos(\omega t - kz)\,\hat{y}$
- $\vec{B} = -(A/c)\cos(\omega t - kz)\,\hat{y}$
- $\vec{B} = (A/c)\cos(\omega t - kz)\,\hat{y}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\vec{B} = (A/c)\cos(\omega t - kz)\,\hat{y}$

5) The bit rate-length product of an optical fiber would be larger if we *1 point*

- increase the numerical aperture
- decrease the numerical aperture
- increase the core diameter
- decraese the core diameter

No, the answer is incorrect.
Score: 0

Accepted Answers:
decrease the numerical aperture

6) Calculate the Bit rate-length product for a fiber with $n_1 = 1.5, n_2 = 1.477$ *1 point*

- 12.8 Mb/s - km
- 12.8 Gb/s - km
- 12.8 Mb/s - m
- 12.8 Kb/s - m

No, the answer is incorrect.
Score: 0

Accepted Answers:
12.8 Mb/s - km

7) 55 μW optical power from a laser diode at 1064 nm is launched into an 8 km long fused silica glass fiber. Assume that Rayleigh scattering is the only loss mechanism at 1064 nm wavelength. Find the output power approximately. ($\alpha_0 = 1.7\ dB/km,\ \lambda_0 = 850\ nm$) *1 point*

- $10\ \mu W$
- $34\ \mu W$
- $21\ \mu W$
- $15\ \mu W$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$15\ \mu W$

8) The approximate value of pulse broadening per km, in a multimode step-index fiber with $n_1 = 1.5, \Delta = 0.015$ will be *1 point*

- 16 ps
- 71 ps
- 16 ns
- 78 ns

No, the answer is incorrect.
Score: 0

Accepted Answers:
78 ns

9) An impulse after travelling through 200 m length of the parabolic index multimode fiber with $n_1 = 1.5, \Delta = 0.015$ will becomes a pulse of.....duration *1 point*

- 109 ps
- 119 ps
- 250 ns
- 205 ns

No, the answer is incorrect.
Score: 0

Accepted Answers:
119 ps

10) Consider an LED source at $\lambda = 850\ nm$ with a spectral width of 50 nm. Calculate the broadening in 5 km due to material dispersion in a fused silica glass. (Given $\frac{d^2n}{d\lambda^2} = 0.0297\ \mu m^{-2}$) *1 point*

- 11 ps
- 21 ps
- 11 ns
- 21 ns

No, the answer is incorrect.
Score: 0

Accepted Answers:
21 ns