Assignment 2

Due on 2020-02-16, 20:09 IST.

The due date for submitting the assignment too passed. As per our rules you have not submitted this assignment.

1. Which one is true for an elliptically polarized wave? (Given: α and β are constants; α > β)
   - $E_x = n_0 E, E_z = 0$ correct
   - $E_y = n_0 E, E_z = 0$ correct
   - $E_z = n_0 E, E_y = 0$ correct
   - $E_x = n_0 E, E_y = 0$ correct
   
   Answer: $E_x = n_0 E, E_z = 0$ correct

2. If the fiber loss in a link is 10 dB, then what would be the output power (dBm) for 25 dBm (input power)?
   - 15 dBm
   - 5 dBm
   - 65 dBm
   - 95 dBm

3. No, the answer is incorrect. 
   No answer is correct.

4. Attenuation coefficient due to Rayleigh scattering in fused silica glass fiber at wavelength 1.55 μm will be given by $\alpha = 1.7 \text{ dB/km}, A = 850 \text{ nm}$

5. An electromagnetic wave is propagating in free space in a direction. If the electric field is given by $E = \cos \omega t - kx$, then which will be the corresponding magnetic field given by
   - $B = -\omega v_0 \sin \omega t - kx$
   - $B = -\omega v_0 \sin \omega t + kx$
   - $B = -\omega v_0 \sin \omega t - kx$
   - $B = -\omega v_0 \sin \omega t + kx$

6. The bit rate x length product of an optical fiber would be larger if we
   - Increase the numerical aperture
   - Decrease the numerical aperture
   - Increase the core diameter
   - Decrease the core diameter

7. No, the answer is incorrect.
   No answer is correct.

8. The answer is incorrect. 
   No answer is correct.

9. Calculate the bit rate x length product for a fiber with $n = 1.5, A = 1.477$
   - 12.88 km - m/s
   - 12.8 km - m/s
   - 12.8 km - m/s
   - 12.8 km - m/s

10. No, the answer is incorrect.
    No answer is correct.

11. 55 μW optical power from a laser diode at 884 nm is launched into an 8 km long fused silica glass fiber. Assume Rayleigh scattering is the only loss mechanism at 1004 nm wavelength. Find the output power approximately $(\alpha_0 = 1.7 \text{ dB/km}, A_0 = 850 \text{ nm})$

12. 10 μW
    - 34 μW
    - 21 μW
    - 13 μW

No, the answer is incorrect. 
No answer is correct.

13. The approximate value of pulse broadening factor, in a multimode step index fiber with $n = 1.5, A = 0.013$ will be

14. No, the answer is incorrect. 
   No answer is correct.

15. An impulse laser traveling through 200 m length of the parabolic index multimode fiber with $n = 1.5, A = 0.013$ will become a pulse of duration

16. 190 ns
    - 119 ns
    - 250 ns
    - 206 ns

No, the answer is incorrect. 
No answer is correct.

17. Consider an LED source at $J = 850 \text{ mW}$ with a spectral width of 10 nm. Calculate the broadening in km due to thermal dispersion in a fused silica glass. [Given $\Delta = 1.6 \times 10^{-4} \text{ km}$]
   - 11 pm
   - 71 pm
   - 16 pm
   - 25 pm

No, the answer is incorrect. 
No answer is correct.

18. 21 μW