Unit 6 - Week 3 Lectures

Assignment-3

The due date for submitting this assignment has passed. **Due on 2019-08-21, 23:59 IST.**
As per our records you have not submitted this assignment.

1) Given step-index optical fiber parameters $n_1 = 1.45, n_2 = 1.444$, core radius = 4.2 μm, and operating wavelength of 1550 nm, V-number of the fiber is *1 point*

- 2.73
- 2.24
- 3.45
- 2.89

No, the answer is incorrect.
Score: 0
Accepted Answers:
2.24

2) For the fiber parameters given in Question 1, cutoff wavelength of the fiber is *1 point*

- 1445.9 nm
- 1064 nm
- 1552.4 nm
- 1448.9 nm

No, the answer is incorrect.
Score: 0
Accepted Answers:
1445.9 nm

3) For efficient propagation of light in an optical fiber, the angle of incidence of light ray at the fiber input should be less than or equal to the angle of acceptance. *1 point*

- True
- False

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

4) For the fiber parameters given in Question 1, acceptance angle of the fiber is (in degrees) *1 point*

- 5.21
- 15.14
- 7.57
- 43.60

No, the answer is incorrect.
Score: 0
Accepted Answers:
7.57

5) Pulse broadening due to intermodal dispersion in the fiber given in Question 1 at an operating wavelength of 1064 nm over the distance of 100 km is *1 point*

- 12.04 μs
- 0.95 μs
- 6.02 μs
- 2 μs

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

6) For a 100 km long fiber having $n_1 = 1.5232, n_2 = 1.52$, core radius of 12.5 μm, and operating wavelength of 1.064 μm, the maximum achievable bit-rate without having inter-symbol interference is *0 points*

- 93.5 Mb/s
- 42.75 Mb/s
- 70 Mb/s
- 50 Mb/s

No, the answer is incorrect.
Score: 0
Accepted Answers:
93.5 Mb/s

7) If the thickness of the parallel plate waveguide is held constant and operating wavelength is fixed, the waveguide modes can be excited at any arbitrary value of the incident angle. *1 point*

- True
- False

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

8) Which of the following expressions is incorrect *1 point*

- $E_x = \frac{-1}{\omega^2\mu\epsilon-\beta^2}\left(j\omega\mu\frac{\partial H_z}{\partial y} + j\beta\frac{\partial E_z}{\partial x}\right)$
- $H_x = \frac{1}{\omega^2\mu\epsilon-\beta^2}\left(j\omega\epsilon\frac{\partial E_z}{\partial x} - j\beta\frac{\partial H_z}{\partial y}\right)$
- $E_y = \frac{1}{\omega^2\mu\epsilon-\beta^2}\left(j\omega\mu\frac{\partial H_z}{\partial x} - j\beta\frac{\partial E_z}{\partial y}\right)$
- $H_y = \frac{-1}{\omega^2\mu\epsilon-\beta^2}\left(j\omega\epsilon\frac{\partial E_z}{\partial x} + j\beta\frac{\partial H_z}{\partial y}\right)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$H_x = \frac{1}{\omega^2\mu\epsilon-\beta^2}\left(j\omega\epsilon\frac{\partial E_z}{\partial x} - j\beta\frac{\partial H_z}{\partial y}\right)$

9) The tangential electric field at a dielectric-conductor interface is *1 point*

- Zero
- Equal to surface charge density on the conductor at the interface
- Equal to surface current
- Non-zero due to normal component of magnetic flux density being continuous

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

10) Ray theory can be used to explain wave nature of light. *1 point*

- True
- False

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