Week 9: Assignment 9

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment.

Due on 2021-09-29, 23:59 IST.

1) The mode confinement principle in a photonic crystal waveguide is same as that of conventional strip/ridge waveguides.   **1 point**

○ True
○ False

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

2) The number of longitudinal modes in a Fabry-Perot cavity can be reduced with the help of mirror with narrowband reflectivity.   **1 point**

○ True
○ False

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

3) DBR mirrors can be used to design a laser oscillating with single longitudinal mode.   **1 point**

○ True
○ False

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

4) A distributed grating structure is defined only in one side wall of a multimode waveguide (supporting TE_0 & $TE_1 modes$) and the input/output single-mode waveguides (supporting $TE_0\ mode$) are adiabatically connected as shown in figure from single mode waveguide. If the TE_0 mode is launched into the single mode waveguide, then at the output how many stop band will appear at the output? Assume only 1st order grating diffraction.

Figure 1: DBR

No, the answer is incorrect.
Score: 0
Accepted Answers:
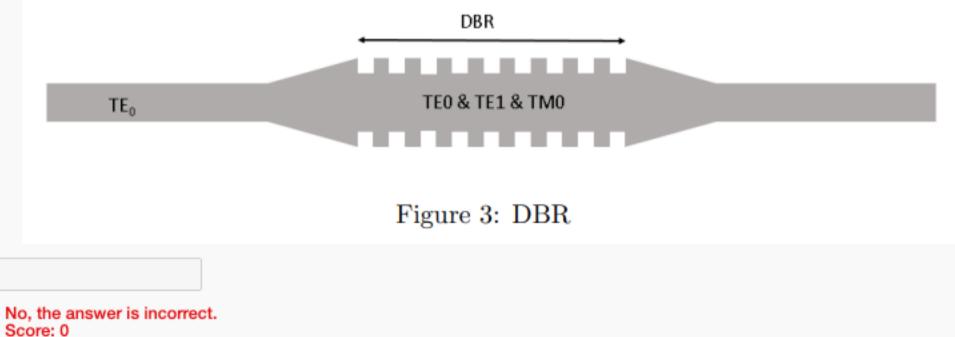*(Type: Numeric) 2*

1 point

5) A distributed grating structure is defined in both side walls of a multimode waveguide (supportingTE_0 & $TE_1 modes$) and the input/output single-mode waveguides (supporting $TE_0\ mode$) are adiabatically connected as shown in figure from single mode waveguide. If the TE_0 mode is launched into the single mode waveguide, then at the output how many stop band will appear at the output? Assume only 1st order grating diffraction.

Figure 2: DBR

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 1

1 point

6) A distributed grating structure is defined in both side walls of a multimode waveguide (supporting TE_0, TE_1 & $TM_0\ modes$) and the input/output single-mode waveguides (supporting $TE_0\ mode$) are adiabatically connected as shown in figure from single mode waveguide. If the TE_0 mode is launched into the single mode waveguide, then at the output how many stop band will appear at the output? Assume only 1st order grating diffraction.

Figure 3: DBR

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 1

1 point

Common data for questions 7 – 8:

A DBR is designed with a single mode SOI waveguide whose dispersion characteristics is given by $n_{eff} = p_1\lambda^2 + p_2\lambda + p_3$, where $p_1 = -1.13 \times 10^{11}[1/m^2]$, $p_2 = -3.557 \times 10^5[1/m]$, and $p_3 = 3.509$, over a broad operating range around 1550 nm. Consider the period of the DBR is 290 nm.

7) What is the Bragg wavelength of the DBR in nm? (in 2 decimal points) _____ nm

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 1555,1556

1 point

8) If the κ is calculated as 0.01 [1/μm], the length of the DBR such that the field amplitude of the transmitted light at Bragg wavelength is reduced by e^{-5} factor is _____ μm.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 499,501

1 point

9) The output power of an MZI will be effected by the same fabrication error introduced in both the arm.   **1 point**

○ True
○ False

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