Week 8: Assignment 8

The due date for submitting this assignment has passed.

Due on 2021-09-22, 23:59 IST.

As per our records you have not submitted this assignment.

1) For the same waveguide and coupler design, the quality factor of add drop MRR is higher than the all pass MRR configuration. ***1 point***

- True
- False

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

2) For the MRR in the all pass configuration, the extinction at the through port is independent of the waveguide loss ***1 point***

- True
- False

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

3) For the MRR in the all pass configuration, the cavity power at resonance decreases with the increase in waveguide loss ***1 point***

- True
- False

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

4) The free spectral range (in terms of frequency) of an MRR, designed with a wavelength-independent directional coupler, is constant. ***1 point***

- True
- False
- depends on the waveguide dispersion

No, the answer is incorrect.
Score: 0
Accepted Answers:
depends on the waveguide dispersion

5) For the MRR in the all pass configuration, the quality factor at a over-coupled wavelength is the quality factor at a under-coupled wavelength ***1 point***

- greater than
- less than
- equal to

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

Common data for questions 6 – 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 the operating range $1520 - 1580$ nm. The length of the DBR is $300\mu m$.

6) What is the required Bragg grating period to have reflection around 1550 nm? (in 2 decimal points) _____ nm

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 288,289

1 point

7) If the κ of the DBR is 0.01 μm^{-1}, what is the full width half maximum (FWHM) bandwidth? _____ nm

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 2.52,2.56

1 point

8) If the κ of the DBR is twice of the previous case, what is the extinction ratio (Difference of transmissions between pass band and stop band) of DBR? _____ dB

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 45,47

1 point

Common data for questions 9 – 10:

An racetrack MRR is designed with a single mode SOI waveguide such that the FSR is 200 GHz around 1550 nm (critically coupled wavelength). The estimated waveguide loss is 1 dB/cm and the 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 the operating range $1520 - 1580$ nm.

9) The Q–factor of the ring at the critically coupled wavelength is _____ x 10^5

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 3,3.5

1 point

10) The power enhancement factor (P_{cavity}/P_{in}) inside the cavity at the critically coupled wavelength is _____ dB

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 19.5,21

1 point