Unit 13 - Week 10 Lectures

Assignment-10

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

Due on 2019-10-09, 23:59 IST.

1) In a fiber Bragg grating (FBG) having grating period of $0.5\mu m$, the launched light has $n_{eff} = 1.4467$. The maximum wavelength reflected back because of the grating is *1 point*

- 723.3 nm
- 1446.7 nm
- 361.7 nm
- 1100 nm

No, the answer is incorrect.
Score: 0
Accepted Answers:
1446.7 nm

2) If a voltage of 2 V is applied to a $LibNO_3$ based electro-optic moduator having $V_\pi = 8V$, the input phase would be shifted by *1 point*

- 45°
- 90°
- 180°
- 360°

No, the answer is incorrect.
Score: 0
Accepted Answers:
45°

3) If phase shift between two arms of an IQ modulator is changed from 90° to 30°, the field transfer function is *1 point*

- $cos\left(\frac{\pi u(t)}{2V_\pi}\right) + e^{j\pi/3} sin\left(\frac{\pi u(t)}{2V_\pi}\right)$
- $cos\left(\frac{\pi u(t)}{2V_\pi}\right) + e^{j\pi/6} sin\left(\frac{\pi u(t)}{2V_\pi}\right)$
- $cos\left(\frac{\pi u(t)}{2V_\pi}\right) + e^{j\pi/2} sin\left(\frac{\pi u(t)}{2V_\pi}\right)$
- $cos\left(\frac{\pi u(t)}{2V_\pi}\right) - e^{j\pi/3} sin\left(\frac{\pi u(t)}{2V_\pi}\right)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$cos\left(\frac{\pi u(t)}{2V_\pi}\right) + e^{j\pi/6} sin\left(\frac{\pi u(t)}{2V_\pi}\right)$

4) In electro-optic modulators to obtain modulation of signal at a very high speed, *1 point*

- length of the electro-optic material is changed with respect to time.
- intensity of the light source is varied with respect to time.
- refractive index of the electro-optic modulator is changed with respect to time.

No, the answer is incorrect.
Score: 0
Accepted Answers:
refractive index of the electro-optic modulator is changed with respect to time.

5) In direct modulation, chirping is introduced because instantaneous frequency of laser changes with time which is one of the major drawback of this modulation technique. *1 point*

- True
- False

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

6) In a Mach-Zehnder interferometer modulator, if the inputs to the phase modulators are given by $u_1(t) = -\frac{V_\pi}{2} + u(t)$ and $u_2(t) = \frac{V_\pi}{2} - u(t)$, the field transfer function (E_{out}/E_{in}) of the MZIM is *1 point*

- $cos(\frac{\pi u(t)}{2V_\pi})$
- $cos(\frac{\pi u(t)}{V_\pi})$
- $sin(\frac{\pi u(t)}{2V_\pi})$
- $sin(\frac{\pi u(t)}{V_\pi})$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$sin(\frac{\pi u(t)}{V_\pi})$

7) For the MZIM given in Question 6, the relationship between $E_{out}(t)$ and $E_{in}(t)$ for $u(t) = \frac{V_\pi}{2}$ is *1 point*

- $E_{out}(t) = E_{in}(t)$
- $E_{out}(t) = E_{in}(t)/\sqrt{2}$
- $E_{out}(t) = -E_{in}(t)/\sqrt{2}$
- $E_{out}(t) = -E_{in}(t)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$E_{out}(t) = E_{in}(t)$

8) If the canonical low pass representation of a signal is given by $cos(100t) + jsin(100t)$. The bandbass signal around the frequency $4000/2\pi$ Hz is given by *1 point*

- $cos(4100t)$
- $cos(3900t)$
- $sin(4100t)$
- $cos(4000t)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$cos(4100t)$

9) If the values of $x_I(t) = A$ and $x_Q(t) = -A$. The bandpass signal at f_0 is given by *1 point*

- $Acos(2\pi f_0 t) - Asin(2\pi f_0 t)$
- $Acos(2\pi f_0 t) + Asin(2\pi f_0 t)$
- $-Acos(2\pi f_0 t) - Asin(2\pi f_0 t)$
- $-Acos(2\pi f_0 t) + Asin(2\pi f_0 t)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$Acos(2\pi f_0 t) + Asin(2\pi f_0 t)$

10) If two or more signals are orthonormal, they are also orthogonal. *1 point*

- True
- False

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