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Courses » Semiconductors Optoelectronics

Announcements **Course** Ask a Question Progress FAQ

## Unit 6 - Week 4

Register for  
Certification exam

### Course outline

How to access  
the portal

Self-assessment  
before course  
start

Week 1

Week 2

Week 3

Week 4

- Bandgap Engineering
- Heterostructure p-n junctions
- Schottky Junctions and Ohmic Contacts
- Fabrication of Heterostructure Devices

- Quiz : Assessment 4
- Solutions of Assessment 4

Week 5

## Assessment 4

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment. **Due on 2019-02-27, 23:59 IST.**

Instructions:

1. Answer **all** questions; all questions carry equal mark.
2. All symbols have their usual meanings.
3. Only one of the options is correct.
4. You can see the correct answers after the last date of submission.

Note:

All questions have three options.

Marks obtained in this quiz will be counted towards your final score. You can take the quiz and submit it any number of times, and the latest submitted answers will be taken as your final submission.

1) Alloying of a binary semiconductor— **1 point**

- Always leads to increase in the bandgap energy
- Always leads to decrease in the bandgap energy
- Can lead to either increase or decrease in the bandgap energy

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*Can lead to either increase or decrease in the bandgap energy*

2) Two semiconductor quantum-well sources of identical material compositions with widths  $L_1$  and  $L_2$ , emit light of wavelengths  $\lambda_1$  and  $\lambda_2$ , respectively. Which one of the following options is correct? **1 point**

- If  $L_1 > L_2$ , then  $\lambda_1 < \lambda_2$

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<b>Week 10</b>	ce De
<b>Week 11</b>	
<b>Week 12</b>	
<b>Exam Instructions</b>	
<b>Lecture Transcripts</b>	

3) The current flow in a forward biased Schottky junction (e.g. Al – n-GaAs) is predominantly **1 point** due to

Thermionic emission

Tunnelling

Diffusion

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**  
*Thermionic emission*

4) Which one of the following Schottky junctions can form a good *ohmic* **1 point** contact?

Ag – n-Si

Ag – n-GaAs

Ag – n-InAs

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**  
*Ag – n-InAs*

5) A simple semiconductor double heterostructure (DH) comprises of a thin layer of Material 2 **1 point** sandwiched between 2 layers of Material 1. Which one of the following DH configurations would lead to *carrier confinement* in the active layer?

GaAs-Al<sub>0.2</sub>Ga<sub>0.8</sub>As-GaAs

InP-In<sub>0.53</sub>Ga<sub>0.47</sub>As-InP

GaAs-AlAs-GaAs

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**  
*InP-In<sub>0.53</sub>Ga<sub>0.47</sub>As-InP*

[Previous Page](#)[End](#)