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NPTEL

reviewer4@nptel.iitm.ac.in ▾

Courses » Fundamentals of semiconductor devices

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Unit 13 - Compound Semiconductors

Register for Certification exam

Course outline

- How to access the portal
- Basics of semiconductor physics
- Equilibrium carrier concentration
- Carrier transport
- p-n junction
- Applications of p-n junctions and details of metal-semiconductor junction
- Bipolar Junction Transistor
- Metal Oxide Semiconductor Capacitor
- MOSFET
- Interaction session

Week 9_Assignment

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment. **Due on 2019-04-03, 23:59 IST.**

1) Which of the following are examples of binary compound III-V semiconductors? ***1 point***

- [ ] SiC
- [ ] InP
- [ ] GaN
- [ ] CdTe

No, the answer is incorrect.
Score: 0

Accepted Answers:
InP
GaN

2) Which of these is an example of a 2D-material? ***1 point***

- ( ) GaP
- ( ) MoS2
- ( ) None of these
- ( ) Both of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
MoS2

3) InGaAs is used in Fiber optic communication with wavelength used being 1.55um. What is the approximate composition of Indium in InGaAs needed to achieve operation at this wavelength (using InAs bandgap of 0.354eV and GaAs bandgap of 1.4eV and assuming Vegard's law approximation). ***2 points***

Score: 0

Accepted Answers:
57%

4) The pseudomorphic thin layer (25nm) of Al0.25Ga0.75N grown epitaxially on GaN is (Lattice constant of GaN is 4.52A and that of AlN is 3.11A) ***1 point***

- Tensile strained
- Compressive strained
- Unstrained
- Epitaxial growth is not possible for the given composition of Al in AlGaAs

No, the answer is incorrect.
Score: 0

Accepted Answers:
Tensile strained

5) In a heterojunction formed by undoped Al0.25Ga0.75N and GaN, the total band discontinuity (assuming Vegard's law approximation, bandgap of AlN is 6.2eV and bandgap of GaN is 3.4eV) is approximately ***1 point***

- 1.2eV
- 0.6eV
- 2eV
- 0eV

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.6eV

6) Which among the following material do not have inversion symmetry? ***1 point***

- GaAs
- AlGaAs
- Si
- InN

No, the answer is incorrect.
Score: 0

Accepted Answers:
InN

7) Which among the following two nitrides are used to make white leds? ***1 point***

- 5-10% of InN and 90-95% of GaN
- 5-10% of AlN and 90-95% of GaN
- 90-96% of InN and 4-10% of GaN
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
5-10% of InN and 90-95% of GaN

8) Which among the following device will not suffer from carrier freeze out? ***1 point***

- nMOS

- pMOS
- GaAs HEMT
- GaN HEMT

No, the answer is incorrect.
Score: 0

Accepted Answers:
GaN HEMT

9) The 2DEG in GaN HEMT is an explicit function of …… and …… ***1 point***

- Surface states and Polarization
- Doping and Scattering
- Surface states and doping
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Surface states and Polarization

10) What are the advantages of GaAs or GaN based HEMT devices? ***1 point***

- Carrier confinement, high current
- High on current and High breakdown voltage
- Low off current and High breakdown voltage
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Carrier confinement, high current

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