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Courses » Fundamentals of semiconductor devices

Announcements **Course** Ask a Question Progress FAQ

Unit 1 - How to access the portal

Register for
Certification exam

Course outline

How to access the portal

- How to access the home page?
- How to access the course page?
- How to access the MCQ, MSQ and Programming assignments?
- How to access the subjective assignments?
- Quiz : Week 0 Assessment

Basics of semiconductor physics

Equilibrium carrier concentration

Carrier transport

p-n junction

Week 0 Assessment

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment. **Due on 2019-02-04, 23:59 IST.**

1) Silicon is the most widely used semiconductor and is almost in all electronic devices we see **1 point** around us. Which of the following statements is false about silicon?

- The processors in mobiles/computers use high-speed digital logic circuits which are made of silicon CMOS.
- Flash memory such as solid-state hard drives are made of silicon.
- Silicon being an indirect band gap material, can not be used to make solar cells.
- The white LEDs which light our houses and streets, do not consist of silicon light emitters.

No, the answer is incorrect.

Score: 0

Accepted Answers:

Silicon being an indirect band gap material, can not be used to make solar cells.

2) Moore's law predicts the future of _____ **1 point**

- Transistors
- Mobile phones
- Resistors
- Capacitors

No, the answer is incorrect.

Score: 0

Accepted Answers:

Transistors

3) Which of the following statements is correct about metal? **1 point**

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Opto-electronic devices: Solar cells and photo-detectors
Opto-electronic devices: Light Emitting Diodes (LED)
Applications of transistors and basics of microelectronic fabrication

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Score: 0**Accepted Answers:***Metals can't be doped extrinsically as p- or n-type.*4) What is the typical thickness of a silicon wafer? **1 point**

- 1 nm to 100 nm
- 100 nm to 1 μ m
- 1 μ m to 100 μ m
- 100 μ m to a few mm

No, the answer is incorrect.**Score: 0****Accepted Answers:***100 μ m to a few mm*5) Which of the following are used as semiconductors? **1 point**

- Molybdenum disulphide (MoS₂)
- Aluminium Oxide (Al₂O₃)
- Indium Phosphide (InP)
- Silicon Carbide (SiC)

No, the answer is incorrect.**Score: 0****Accepted Answers:***Indium Phosphide (InP)**Silicon Carbide (SiC)*6) Silicon wafers are circular with diameters that typically range between **1 point**

- ½ to 1 inch
- 1 to 2 inch
- 2 to 12 inch
- 16 to 48 inch

No, the answer is incorrect.**Score: 0****Accepted Answers:***2 to 12 inch*7) Which of the following semiconductor wafers would be completely transparent? The band gap is mentioned beside each. **1 point**

- Silicon (1.1 eV)
- Gallium Nitride, GaN (3.4 eV)
- Gallium Arsenide, GaAs (1.42 eV)
- Germanium (0.68 eV)

No, the answer is incorrect.**Score: 0****Accepted Answers:***Gallium Nitride, GaN (3.4 eV)*8) Which of the following statements is correct? **1 point**

- Junction formed between two different semiconductor materials is called p-n junction

- A diode can be either Schottky diode or a p-n junction diode
- A silicon p-n junction cannot act like a solar cell
- A silicon p-n junction can have a turn-on voltage of 2 V

No, the answer is incorrect.

Score: 0

Accepted Answers:

A diode can be either Schottky diode or a p-n junction diode



9) The maximum efficiency a silicon solar cell can have, theoretically, is

1 point

- Less than 10%
- Less than 20%
- Close to 50%
- Slightly above 30%



No, the answer is incorrect.

Score: 0

Accepted Answers:

Slightly above 30%

10) Mid-infrared (mid-IR) consists of wavelengths between 2 to 5 μm , and detectors which work in mid-IR, have enormous applications in the airport & tactical security, skin cancer detection, etc. Silicon is not used to make such mid-IR detectors because

1 point

- Silicon is so widely used in making computer processors and other electronic devices that it will be a waste of silicon to use it to make mid-IR detectors
- Silicon cannot absorb mid-IR, hence can't work in mid-IR
- Silicon mid-IR detectors do not perform as well as those made from some other semiconductors.
- Silicon emits mid-IR wavelengths, so if silicon is used, it will lead to signal interference.

No, the answer is incorrect.

Score: 0

Accepted Answers:

Silicon cannot absorb mid-IR, hence can't work in mid-IR

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