Fundamentals of semiconductor devices - - Unit ...

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 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 _____________

- 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?

- Silicon is the most widely used semiconductor and is almost in all electronic devices we see 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:
4) What is the typical thickness of a silicon wafer?  
- 1 nm to 100 nm  
- 100 nm to 1 µm  
- 1 µm to 100 µm  
- 100 µm to a few mm  

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
- 100 µm to a few mm

5) Which of the following are used as semiconductors?  
- 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  
- 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.  
- 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?  
- Junction formed between two different semiconductor materials is called p-n junction  

Score: 1

Accepted Answers:  

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

- 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 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