Quiz 05 - Semiconductors

Due Dec 14 at 11:59pm **Points** 135 **Questions** 25
Available Aug 24 at 12pm - Dec 14 at 11:59pm 4 months **Time Limit** None
Allowed Attempts 2

Instructions

Covers lecture and lab topics from classes 17 through 20

Attempt History

	Attempt	Time	Score
KEPT	Attempt 2	9 minutes	130 out of 135
LATEST	Attempt 2	9 minutes	130 out of 135
	Attempt 1	21 minutes	128.33 out of 135

Score for this attempt: **130** out of 135
Submitted Dec 9 at 6:45am
This attempt took 9 minutes.

Question 1 — 5 / 5 pts

Semiconductor materials have this many electrons in their valence electron bands. (3 correct answers)

- [ ] 7
- [x] 4 — Correct!
- [ ] 6
- [ ] 2
- [ ] 8

- [ ] 1

Correct! - [x] 5

Correct! - [x] 3

Question 2

5 / 5 pts

Tetravalent materials combined with pentavalent materials produces

- An extra "hole"
- A stable atomic structure
- An unstable atomic structure

Correct! - (•) An extra electron

Question 3

5 / 5 pts

An N-type semiconductor material is made of [tetra] valent and [penta] valent materials, and has extra [electrons] .

Answer 1:

Correct! tetra

orrect Answer penta

Answer 2:

Correct! penta

orrect Answer tetra

Answer 3:

Correct! electrons

orrect Answer electron

Question 4

5 / 5 pts

A P-type semiconductor material is made of [tetra] valent and [tri] valent materials, and has extra [holes] .

Answer 1:

Correct! tetra

orrect Answer tri

Answer 2:

Correct! tri

orrect Answer tetra

Answer 3:

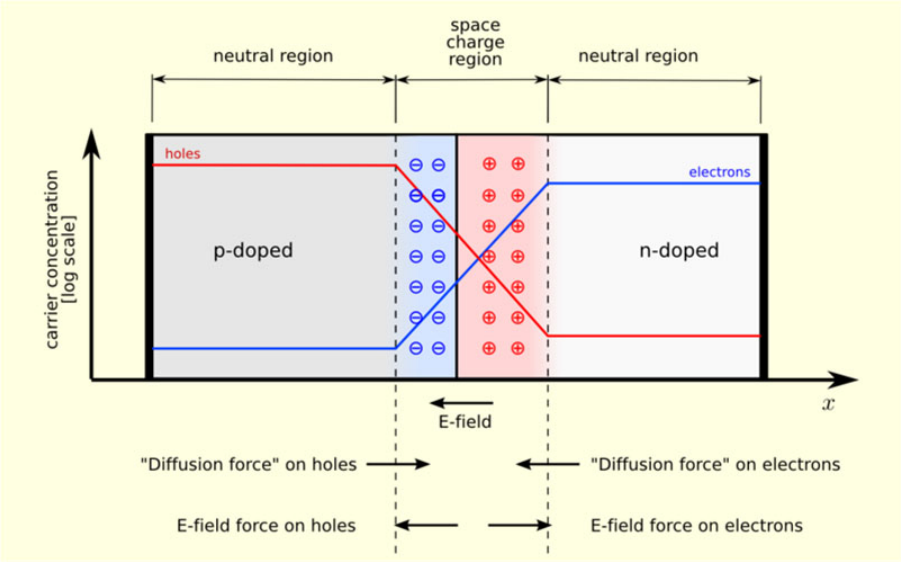
Correct! holes

orrect Answer hole

Question 5

5 / 5 pts

The depletion region in this illustration is labeled



Correct!

- (●) The space charge region
- ( ) p-doped
- ( ) n-doped
- ( ) The neutral region

Question 6

5 / 5 pts

A reverse biased PN junction (three correct answers)

- [ ] Has no depletion region

Correct!

- [x] Is an excellent insulator

Correct!

- [x] Is connected to a voltage source with the N-material more positive then the P material.
- [ ] Is an excellent conductor

- [ ] Is connected to a voltage source with the N-material more negative then the P material.

Correct!

- [x] Has a large depletion region

Question 7

5 / 5 pts

A forward biased PN junction (three correct answers)

- [ ] Has a large depletion region

Correct!

- [x] Is connected to a voltage source with the N-material more negative then the P material.

Correct!

- [x] Has a no depletion region
- [ ] Is connected to a voltage source with the N-material more positive then the P material.
- [ ] Is an excellent insulator

Correct!

- [x] Is an excellent conductor

Question 8

5 / 5 pts

The barrier potential of a forward biased silicon PN junction is typically between 0.6V and 0.7V.

Correct!

- (•) True

False

Yes! The depletion regions created by silicon semiconductors require from 0.6 to 0.7 volts of positive bias before they will conduct. Germanium semiconductors require just 0.3 to 0.4 volts of forward bias to establish conductivity.

Question 9

5 / 5 pts

The barrier potential of a forward biased germanium PN junction is typically between 0.6V and 0.7V.

True

Correct!

False

Yes! The depletion regions created by silicon semiconductors require from 0.6 to 0.7 volts of positive bias before they will conduct. Germanium semiconductors require just 0.3 to 0.4 volts of forward bias to establish conductivity.

Question 10

5 / 5 pts

A diode is

A three-terminal semiconductor device that allows current to flow in one direction

A three-terminal semiconductor device that allows current to flow in two directions

Correct!

A two-terminal semiconductor device that allows current to flow in one direction

A two-terminal semiconductor device that allows current to flow in two directions

Question 11

5 / 5 pts

Select the schematic symbol for a Zener diode.

Correct!

Question 12

10 / 10 pts

Match the diode type with it's description

Correct!

Rectifier diode A diode optomized for alte ▾

Correct!

Switching diode

A diode optomized for hig

Correct! **Zener diode** A diode optimized to oper

Correct! **Light emitting** A diode optomized to emit

Correct! **Photo diode** A diode optomized to sens

Question 13

5 / 5 pts

The three types of rectifiers are

Correct! ☑ Bridge

☐ Square wave

☐ Sine wave

☐ Tunnel

Correct! ☑ Half-wave

Correct! ☑ Full-wave

Question 14

5 / 5 pts

A rectifier produces a constant current output.

○ True

Correct! False

Question 15

5 / 5 pts

Ripple is the unwanted periodic variation in the DC output of a rectifier .

Answer 1:

Correct! periodic

Answer 2:

Correct! DC

Answer 3:

Correct! rectifier

Question 16

0 / 5 pts

A full wave rectifier with a 60 Hertz input and a 5000 uF filter capacitor produces 5 amps of current. Calculate the ripple voltage for this power supply.

'ou Answered 1.6

orrect Answers 8.33 (with margin: 0.416)

Question 17

10 / 10 pts

Match the DC power supply function with it's description.

Correct!	**Voltage transformation**	The use of an AC transforr ▾
Correct!	**Energy conversion**	The conversion of electric ▾
Correct!	**Filtration**	The reduction of pulsating ▾
Correct!	**Regulation**	The control of a power sup ▾
Correct!	**Isolation**	The prevention of charge t ▾
Correct!	**Protection**	The protection of power su ▾

Question 18

5 / 5 pts

Linear power supplies have better overall efficiency than do switched mode supplies.

- true
- Correct! false

Linear - 30 to 40% efficient

Switched mode - 60 to 90% efficient

Question 19

5 / 5 pts

Switched mode power supplies are generally smaller and lighter than are linear supplies.

Correct!

- (•) True
- ( ) False

Question 20

5 / 5 pts

The name transistor is derived from the words

- ( ) Transconductance relay
- ( ) Transformer reactor

Correct!

- (•) transfer resistor
- ( ) Transmitter radio

Question 21

5 / 5 pts

Match the bipolar junction transistor connection with its description

Correct!

Emitter — emits electrons to the bas ▾

Correct!

Collector — collects electrons from the ▾

Correct!

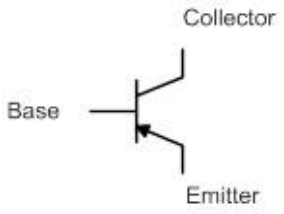
Base

controls the base emitter j ▾

Question 22

5 / 5 pts

This schematic symbol represents which type of transistor?



Correct!

- (•) PNP
- ( ) MOSFET
- ( ) JFET
- ( ) NPN

Question 23

5 / 5 pts

When compared to electromechanical relays, transistors are very fast , can provide trillions of operations, require low current drivers, and can be computer controlled.

Answer 1:

Correct!

fast

Answer 2:

Correct! trillions

Answer 3:

Correct! low

Answer 4:

Correct! computer

Question 24

5 / 5 pts

A bipolar junction transistor has a base current of 100 micro-amps and a collector current of 10 mili-amps. Calculate the transistor beta.

Correct! 100

orrect Answers 100 (with margin: 0)

Question 25

5 / 5 pts

Match the transistor performance type with it's description.

Correct! **Cutoff** the transistor is non-condu

Correct! **Active** the transistor is partially c

Correct! **Saturation** the transistor is fully cond

Other Incorrect Match Options:

- the transistor has lost its smoke

Quiz Score: **130** out of 135