
Started on Tuesday, 10 October 2017, 12:04 PM

State Finished

Completed on Tuesday, 10 October 2017, 12:07 PM

Time taken 3 mins 26 secs

Grade 4.0 out of 10.0 (40%)

Question 1

Correct

Mark 1.0 out of 2.0

Which of the following is the best balance between ease of use and accuracy to quickly analyze diode circuits?

Select one:

- ☐ a. The ideal diode model
- ☐ b. Graphical analysis using a load line
- ☐ c. None of these
- ☒ d. The constant voltage drop diode model ✓
- ☐ e. Iterative analysis using the exponential diode model

The correct answer is: The constant voltage drop diode model

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

For a Full Wave Rectifier the diodes must be able to handle a Peak Inverse Voltage equal to nearly twice the peak of the input voltage.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

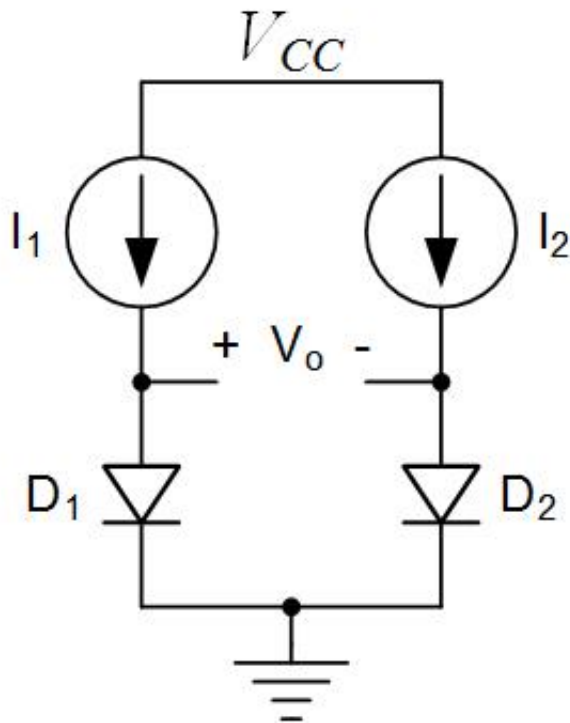
Correct

Marks for this submission: 2.0/2.0.

Question 3

Not answered

Mark 0.0 out of 2.0



For the diode circuit shown, what is the output voltage, V_o , in millivolts? Assume that $I_1 = 3I_2$, and the junction area of D_2 is 11x as large as the junction area for D_1 . Use $V_t = kt/q = 26\text{mV}$. (Hint: You don't need to know the values for V_{CC} , I_1 , I_2 or for I_{s1} , I_{s2} . All you need to solve this problem is the ratios given!)

Answer: ✗

The correct answer is: 90.9

Question 4

Correct

Mark 1.0 out of 2.0

Which of the following is true about the small-signal model for a reverse biased diode?

Select one:

- ☐ a. The small-signal model is valid for any amount of reverse bias current
- ☐ b. None of these
- ☐ c. The reverse diode voltage is equal to the battery voltage for all values of current
- ☒ d. The small-signal model is valid for reverse bias voltages $>$ the knee voltage, V_{zk} ✓
- ☐ e. The incremental resistance of the diode is equal to the slope of the diode I-V curve

The correct answer is: The small-signal model is valid for reverse bias voltages $>$ the knee voltage, V_{zk}

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 0.0 out of 2.0

The incremental resistance for a Zener diode is used to model how much the voltage across the reverse biased diode increases as the reverse current flowing through it increases.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on Tuesday, 10 October 2017, 12:21 PM

State Finished

Completed on Tuesday, 10 October 2017, 12:24 PM

Time taken 2 mins 21 secs

Grade 6.0 out of 10.0 (60%)

Question 1

Correct

Mark 1.0 out of 2.0

Which of the following is true for a zener diode used as a voltage reference?

Select one:

- ☒ a. The amount the reference voltage varies when the input supply voltage varies is called the line regulation ✓
- ☐ b. The input supply voltage used must never be larger than the reverse breakdown voltage of the zener diode
- ☐ c. The amount the reference voltage varies when the load current varies is called the line regulation
- ☐ d. None of these
- ☐ e. Once a zener diode is operating in the reverse breakdown region, the voltage across it doesn't vary

The correct answer is: The amount the reference voltage varies when the input supply voltage varies is called the line regulation

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

As the bias current flowing through a forward biased silicon diode increases, the voltage across the diode will increase quickly.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Not answered

Mark 0.0 out of 2.0

A full-wave diode rectifier circuit is driven by a 60Hz sine wave with a peak value of 17V. If the load resistance this circuit drives is $9.2\text{k}\Omega$ and a $140\mu\text{F}$ filter capacitor is used, then what is the ripple voltage at the output in millivolts peak-to-peak?

Answer: ✗

The correct answer is: 110.0

Question 4

Correct

Mark 1.0 out of 2.0

If a diode at 300°K with a constant bias current of 10 μ A has a forward voltage of 700mV across it, what will the voltage drop across this same diode be if the bias current is increased to 1mA?

Select one:

- ☒ a. 820mV ✓
- ☐ b. 640mV
- ☐ c. 760mV
- ☐ d. None of these
- ☐ e. 580mV

The correct answer is: 820mV

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 2.0 out of 2.0

In the small-signal equivalent for a circuit containing a forward biased diode, the diode is replaced by it's small-signal resistance which is inversely proportional to the operating temperature.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0.

Started on Tuesday, 10 October 2017, 12:25 PM

State Finished

Completed on Tuesday, 10 October 2017, 12:26 PM

Time taken 1 min 13 secs

Grade 4.0 out of 10.0 (40%)

Question 1

Correct

Mark 1.0 out of 2.0

Which of the following circuits is part of a typical DC power supply?

Select one:

- ☐ a. A low pass filter
- ☐ b. A diode rectifier
- ☐ c. A voltage regulator
- ☒ d. All of these ✓
- ☐ e. A power transformer

The correct answer is: All of these

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

Peak Detectors are often used to create an output voltage which is equal to the maximum value of an input signal.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

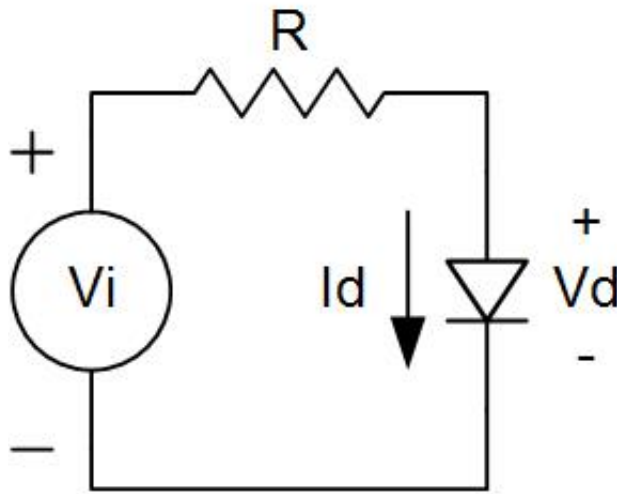
Correct

Marks for this submission: 2.0/2.0.

Question 3

Not answered

Mark 0.0 out of 2.0



If the DC bias current, I_d , in the diode circuit shown is equal to 0.3 mA then what is the voltage across the diode, V_d , in millivolts? Use the exponential diode equation, and assume that the saturation current for the diode, I_s , is equal to 8 fA. (Note that 1 fA = 1 femtoamp = 1×10^{-15} A.) Also assume that the thermal voltage is equal to $V_t = kT/q = 26$ mV. Since the diode current is very sensitive to small changes in the diode voltage, be sure to give your answer to the nearest millivolt!

Answer: ✗

The correct answer is: 633

Question 4

Correct

Mark 1.0 out of 2.0

In a DC Restorer diode circuit, which of the following is true?

Select one:

- ☒ a. The peak-to-peak output voltage is equal to the peak-to-peak input voltage ✓
- ☐ b. The capacitor charges up to the average value of input voltage
- ☐ c. The capacitor clamps one side of the diode to a fixed voltage, such as ground
- ☐ d. The average value of the output voltage is always equal to zero
- ☐ e. None of these

The correct answer is: The peak-to-peak output voltage is equal to the peak-to-peak input voltage

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 0.0 out of 2.0

The final stage in a power supply is a voltage regulator, which keeps the output voltage constant as both the input voltage and the load current vary.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on Tuesday, 10 October 2017, 12:48 PM

State Finished

Completed on Tuesday, 10 October 2017, 1:03 PM

Time taken 15 mins 16 secs

Grade 6.0 out of 10.0 (60%)

Question 1

Correct

Mark 1.0 out of 2.0

If a diode at 300°K with a constant bias current of 100μA has a forward voltage of 700mV across it, what will the voltage drop across this same diode be if the bias current is increased to 1mA?

Select one:

- ☐ a. 580mV
- ☐ b. None of these
- ☒ c. 760mV ✓
- ☐ d. 820mV
- ☐ e. 640mV

The correct answer is: 760mV

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 0.0 out of 2.0

In a full-wave rectifier the diodes turn on once during each period of the input sine wave to recharge the filter capacitor.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

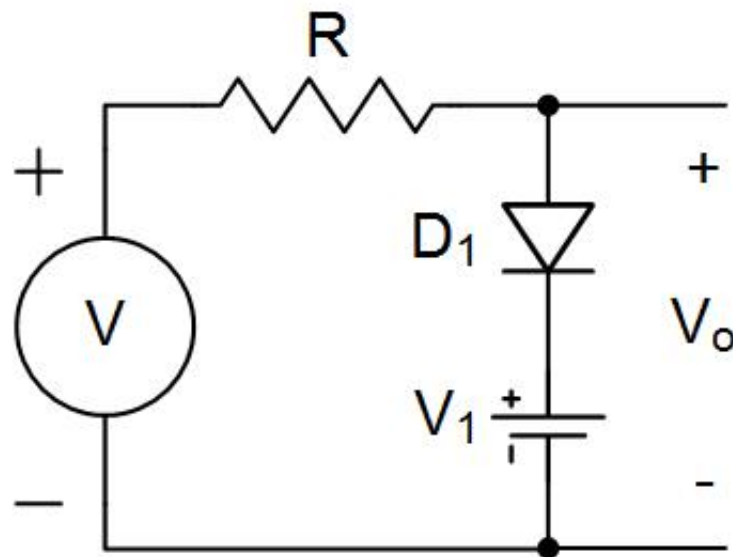
Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Correct

Mark 2.0 out of 2.0



For the diode circuit shown, what will the output voltage, V_o , be in volts if the input voltage, V , is equal to $-1V$? Assume that when the diode is turned on the voltage across it will be $0.7V$, and for the battery use $V_1 = 5.7V$. Also use $R = 5.4k\Omega$.

Answer: 

The correct answer is: -1.00

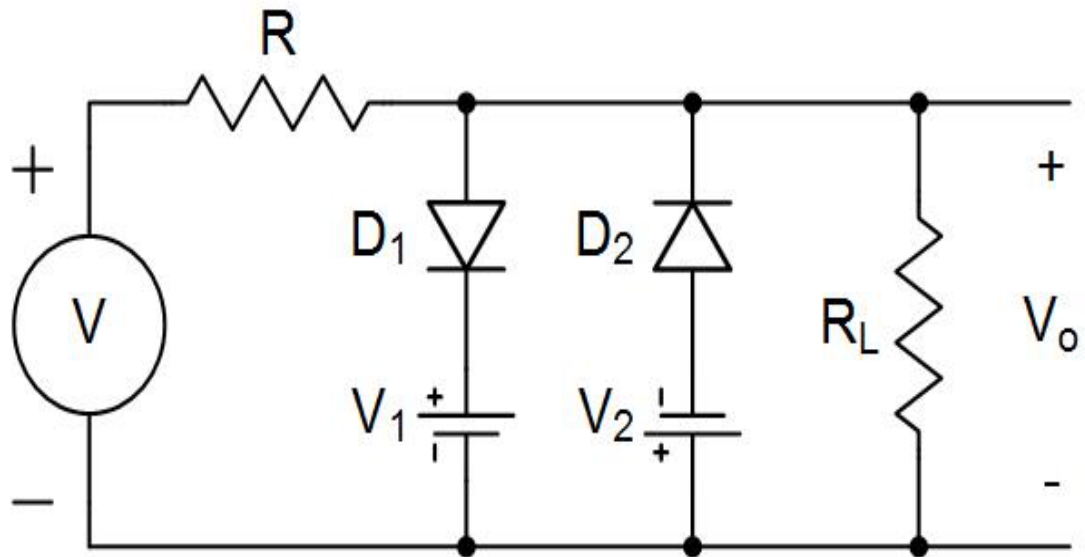
Correct

Marks for this submission: 2.0/2.0.

Question 4

Correct

Mark 1.0 out of 2.0



Assuming ideal diodes, for the diode circuit shown :

Select one:

- ☐ a. The gain is equal to 0 when V is $< +V_1$ and $> -V_2$
- ☐ b. The maximum output voltage is $-V_1$
- ☐ c. None of these
- ☒ d. The gain is equal to 0 when V is $> +V_1$, or $< -V_2$ ✓
- ☐ e. The minimum output voltage is $+V_2$

The correct answer is: The gain is equal to 0 when V is $> +V_1$, or $< -V_2$

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 2.0 out of 2.0

The average current which flows in the rectifier diodes for a power supply is typically about twice the peak current which flows in these same rectifier diodes.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

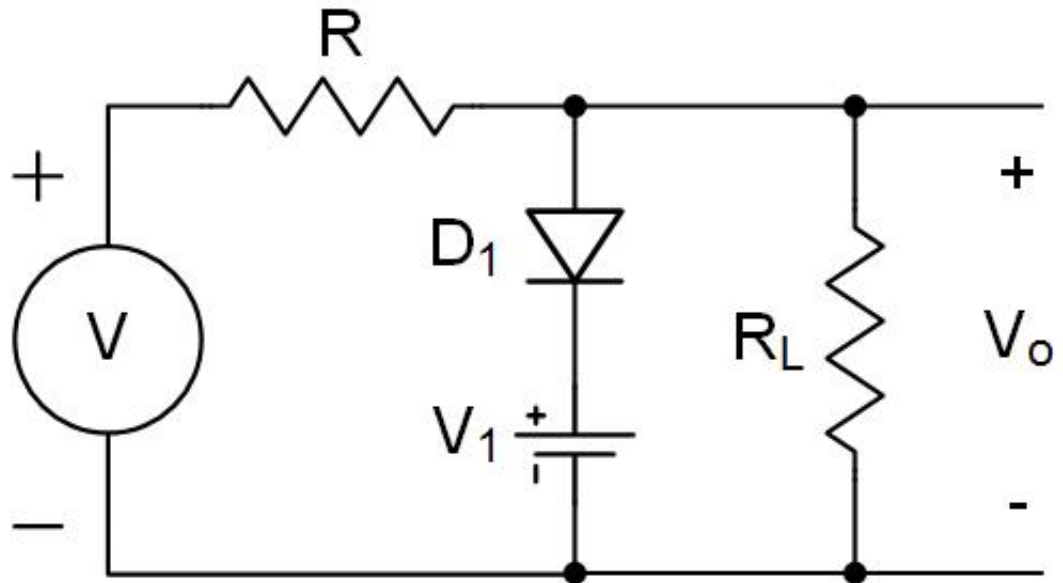
Correct

Marks for this submission: 2.0/2.0.

Question 1

Correct

Mark 1.0 out of 2.0



The diode circuit shown is a :

Select one:

- ☐ a. DC restorer circuit
- ☐ b. None of these
- ☒ c. Limiter circuit ✓
- ☐ d. Peak detector circuit
- ☐ e. Voltage doubler circuit

The correct answer is: Limiter circuit

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

The size of the ripple voltage at the output of a power supply filter capacitor is inversely proportional to the frequency of the input sine wave.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Not answered

Mark 0.0 out of 2.0

A half-wave diode rectifier circuit is driven by a 60Hz sine wave with a peak value of 12V. If the load resistance this circuit drives is $5.2\text{k}\Omega$ and a $322\mu\text{F}$ filter capacitor is used, then what is the ripple voltage at the output in millivolts peak-to-peak?

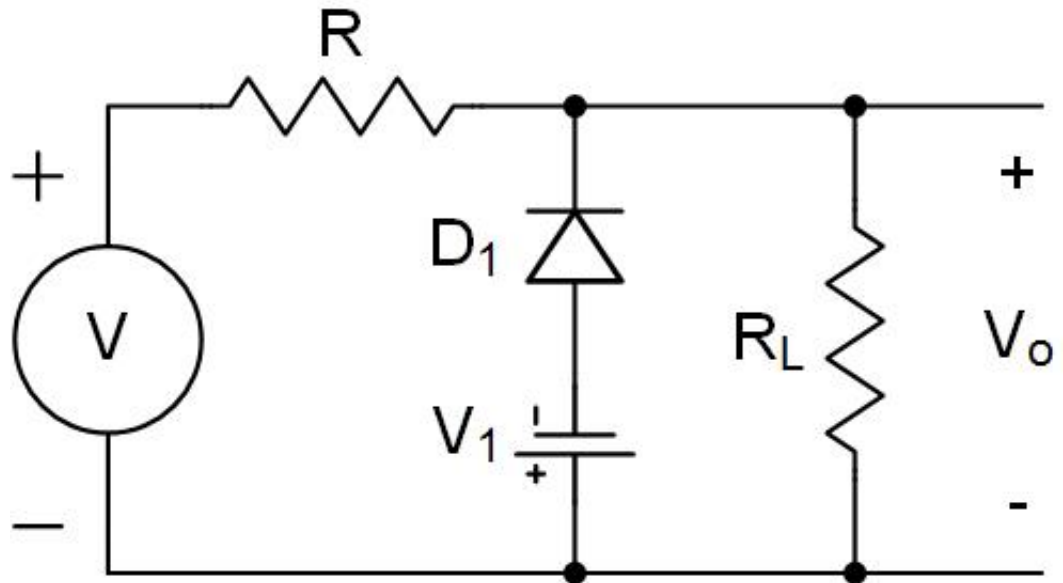
Answer: ✗

The correct answer is: 119.4

Question 4

Correct

Mark 1.0 out of 2.0



Assuming ideal diodes, for the diode circuit shown :

Select one:

- ☐ a. The minimum output voltage is $+V_1$
- ☒ b. The maximum output voltage is not limited ✓
- ☐ c. The gain is equal to $R_L/(R+R_L)$ when V is $< -V_1$
- ☐ d. All of these
- ☐ e. The gain is equal to 0 when V is $> -V_1$

The correct answer is: The maximum output voltage is not limited

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 0.0 out of 2.0

When a forward bias voltage is applied across a diode, the diode current will increase exponentially as the voltage across the diode increases linearly.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

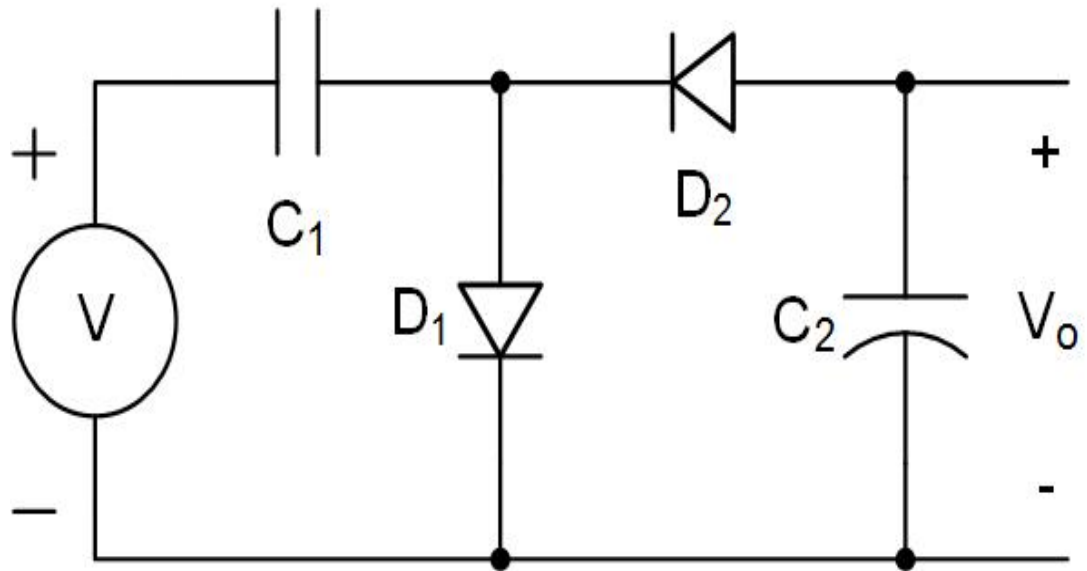
Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 1

Correct

Mark 1.0 out of 2.0



The diode circuit shown is a :

Select one:

- ☐ a. Peak detector circuit
- ☐ b. None of these
- ☐ c. Limiter circuit
- ☐ d. DC restorer circuit
- ☒ e. Voltage doubler circuit ✓

The correct answer is: Voltage doubler circuit

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 0.0 out of 2.0

To solve a nonlinear circuit equation by iteration, you should use logarithms instead of exponentials to aid in convergence.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

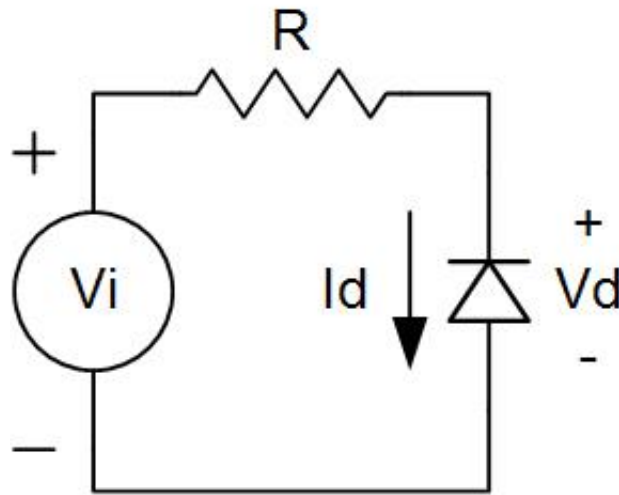
Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Not answered

Mark 0.0 out of 2.0



The diode in the circuit shown has a reverse breakdown voltage of $V_z = 7.3\text{V}$ at $I_z = 5.5\text{mA}$ and an incremental resistance of $r_z = 78\Omega$. What will the DC bias current, I_d , be in milliamps if $V_i = 13.4\text{V}$ and $R = 536\Omega$?

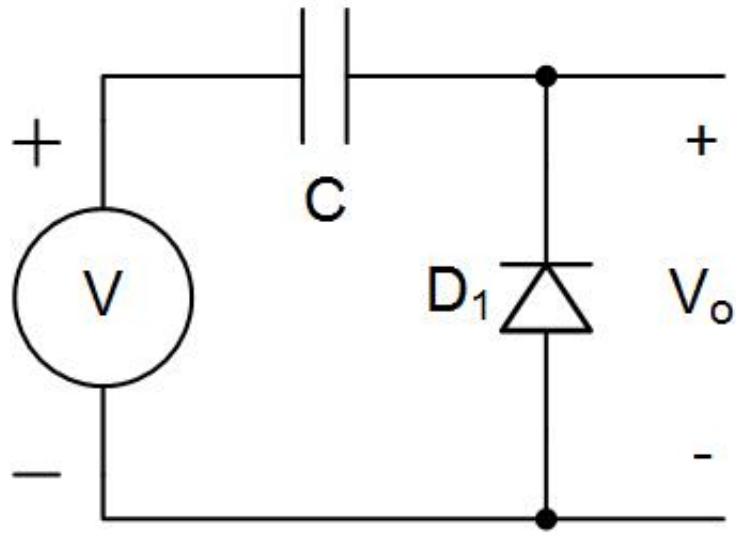
Answer: ✗

The correct answer is: 10.63

Question 4

Correct

Mark 1.0 out of 2.0



The diode circuit shown is a :

Select one:

- ☐ a. Limiter circuit
- ☐ b. Peak detector circuit
- ☐ c. Voltage doubler circuit
- ☐ d. None of these
- ☒ e. DC restorer circuit ✓

The correct answer is: DC restorer circuit

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 0.0 out of 2.0

As the bias current flowing through a forward biased silicon diode at room temperature increases, the voltage across the diode will decrease at a rate of about -60mV per decade of current increase.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on Tuesday, 10 October 2017, 12:31 PM

State Finished

Completed on Tuesday, 10 October 2017, 12:37 PM

Time taken 6 mins 27 secs

Grade 6.0 out of 10.0 (60%)

Question 1

Correct

Mark 1.0 out of 2.0

In a Half-wave rectifier with a filter capacitor, the minimum breakdown voltage required for the diodes is :

Select one:

- ☐ a. The peak-to-peak input voltage
- ☐ b. The peak input voltage
- ☐ c. None of these
- ☒ d. The peak-to-peak input voltage minus 1 diode drop ✓
- ☐ e. The peak input voltage minus 1 diode drop

The correct answer is: The peak-to-peak input voltage minus 1 diode drop

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

In a DC Restorer circuit, a diode typically clamps the output voltage as it tries to move in one direction, and prevents it from going much past the peak input voltage.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Incorrect

Mark 0.0 out of 2.0

A half-wave diode rectifier circuit is driven by a 60Hz sine wave with a peak value of 15V. If the load resistance this circuit drives is $5.4\text{k}\Omega$ and the ripple voltage at the output is 0.15 V_{peak-to-peak}, then during what percent of each cycle does the diode conduct?

Answer: ✗

The correct answer is: 2.25

Incorrect

Marks for this submission: 0.0/2.0.

Question 4

Correct

Mark 1.0 out of 2.0

Which of the following allows diode circuits to be analyzed without solving equations?

Select one:

- ☐ a. Iterative analysis using the exponential diode model
- ☐ b. The constant voltage drop diode model
- ☐ c. The ideal diode model
- ☒ d. Graphical analysis using a load line ✓
- ☐ e. None of these

The correct answer is: Graphical analysis using a load line

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 2.0 out of 2.0

Superposition can be used to analyze nonlinear devices such as diodes as long as the variations around the bias point are kept small enough.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Started on Tuesday, 10 October 2017, 12:26 PM

State Finished

Completed on Tuesday, 10 October 2017, 12:30 PM

Time taken 3 mins 40 secs

Grade 4.0 out of 10.0 (40%)

Question 1

Correct

Mark 1.0 out of 2.0

In a DC Restorer diode circuit, which of the following is true?

Select one:

- ☐ a. The capacitor clamps one side of the diode to a fixed voltage, such as ground
- ☒ b. The average value of the output voltage is not equal to zero ✓
- ☐ c. The peak-to-peak output voltage is equal to the peak input voltage
- ☐ d. The capacitor charges up to the average value of input voltage
- ☐ e. All of these

The correct answer is: The average value of the output voltage is not equal to zero

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

A bridge rectifier requires half as many diodes as a full wave rectifier which uses a center-tapped transformer.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

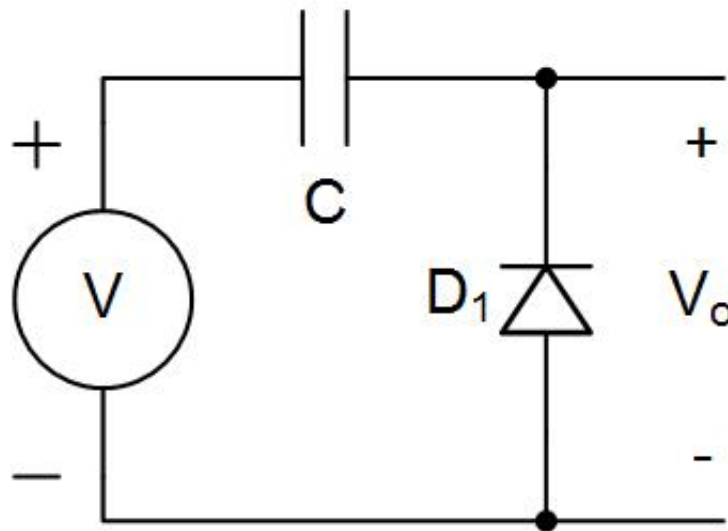
Correct

Marks for this submission: 2.0/2.0.

Question 3

Incorrect

Mark 0.0 out of 2.0



For the diode circuit shown, what will the maximum output voltage, V_o , be in volts if the input voltage, V , is a square wave which varies between $+6.3\text{V}$ and -9.2V ? Assume that when the diode is turned on the voltage across it will be 0.7V .

Answer: 6.3



The correct answer is: 14.8

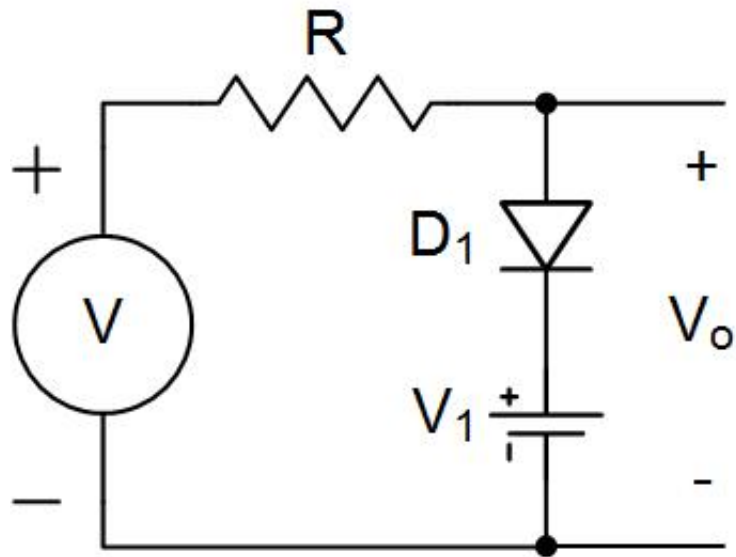
Incorrect

Marks for this submission: 0.0/2.0.

Question 4

Correct

Mark 1.0 out of 2.0



Assuming ideal diodes, for the diode circuit shown :

Select one:

- ☐ a. The minimum output voltage is not limited
- ☐ b. The maximum output voltage is $+V_1$
- ☐ c. The gain is equal to 1 when V is $< +V_1$
- ☒ d. All of these ✓
- ☐ e. The gain is equal to 0 when V is $> +V_1$

The correct answer is: All of these

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 0.0 out of 2.0

Diode limiters are used to control the gain of a circuit after the diodes turn on.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on Tuesday, 10 October 2017, 1:04 PM

State Finished

Completed on Tuesday, 10 October 2017, 1:05 PM

Time taken 1 min 25 secs

Grade **2.0** out of 10.0 (**20%**)

Question 1

Correct

Mark 0.0 out of 2.0

In a Voltage Doubler diode circuit, which of the following is true?

Select one:

- ☐ a. One of the diodes and one of the capacitors implement a limiter circuit
- ☐ b. The diodes must have a breakdown voltage equal to the peak input voltage
- ☒ c. None of these ✓
- ☐ d. One of the diodes and one of the capacitors implement a rectifier circuit
- ☐ e. The output will be a sine wave with a peak of either +2 or -2 times the peak input voltage, depending on the direction of the diodes

The correct answer is: None of these

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 2

Correct

Mark 0.0 out of 2.0

The size of the ripple voltage at the output of a power supply filter capacitor is directly proportional to the size of the filter capacitor used.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

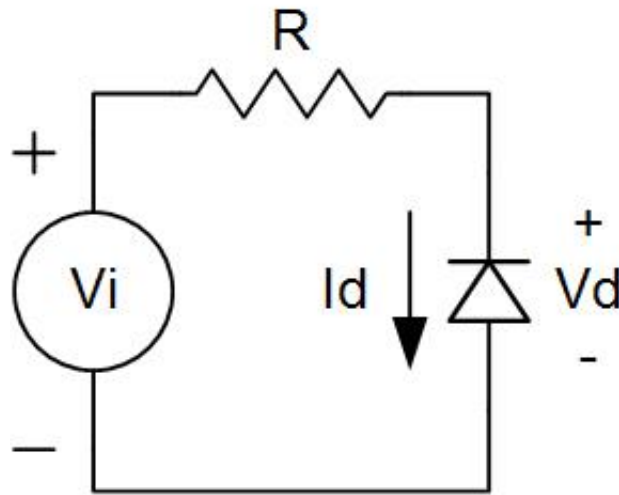
Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Not answered

Mark 0.0 out of 2.0



The diode in the circuit shown has a reverse breakdown voltage of $V_z = 6.0\text{V}$ at $I_z = 7.9\text{mA}$ and an incremental resistance of $r_z = 95\Omega$. What will the voltage across the diode, V_d , be in volts if $V_i = 11.6\text{V}$ and $R = 602\Omega$? Note that since the change in V_z from its nominal value will be small, be sure to give your answer to the nearest millivolt!

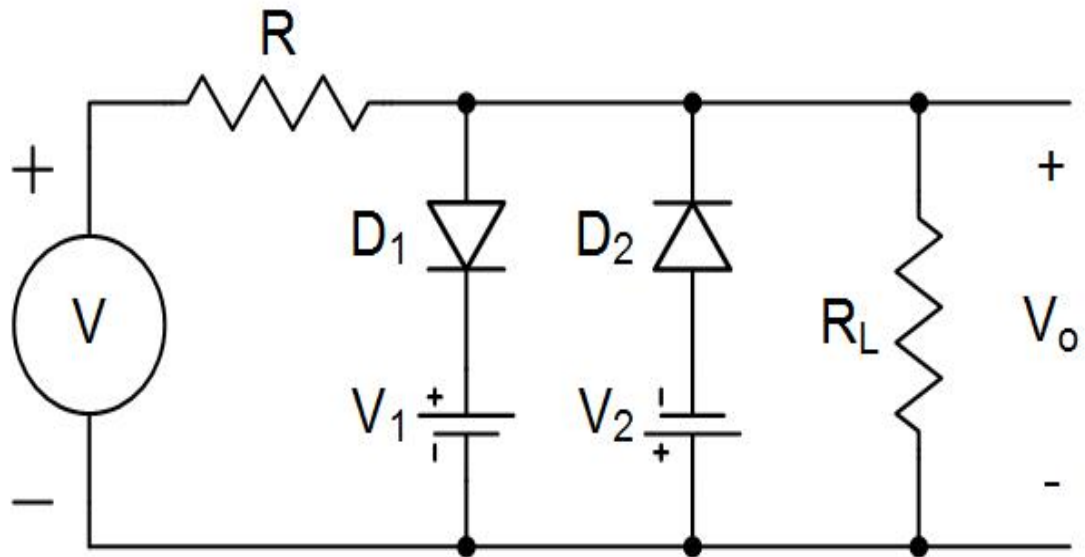
Answer: ✗

The correct answer is: 6.115

Question 4

Correct

Mark 2.0 out of 2.0



Assuming ideal diodes, for the diode circuit shown :

Select one:

- ☐ a. The minimum output voltage is $-V_2$
- ☐ b. The gain is equal to $R_L/(R+R_L)$ when V is $< +V_1$ and $> -V_2$
- ☐ c. The maximum output voltage is $+V_1$
- ☐ d. The gain is equal to 0 when V is $> +V_1$, or $< -V_2$
- ☒ e. All of these ✓

The correct answer is: All of these

Correct

Marks for this submission: 2.0/2.0.

Question 5

Correct

Mark 0.0 out of 2.0

The RC time constant for the filter capacitor in a power supply is typically set much smaller than the period of the input sine wave.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

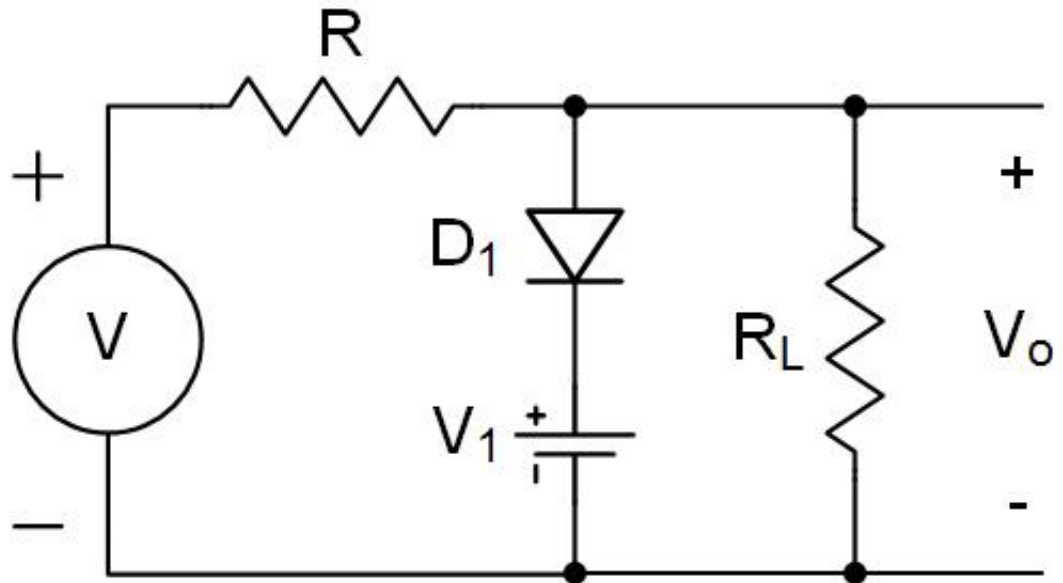
Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 1

Correct

Mark 1.0 out of 2.0



Assuming ideal diodes, for the diode circuit shown :

Select one:

- ☐ a. The minimum output voltage is $+V_1$
- ☒ b. The maximum output voltage is $+V_1$ ✓
- ☐ c. None of these
- ☐ d. The gain is equal to 0 when V is $< +V_1$
- ☐ e. The gain is equal to $R_L/(R+R_L)$ when V is $> +V_1$

The correct answer is: The maximum output voltage is $+V_1$

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 0.0 out of 2.0

In Peak Detector circuits, the diodes conduct current the majority of the time.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

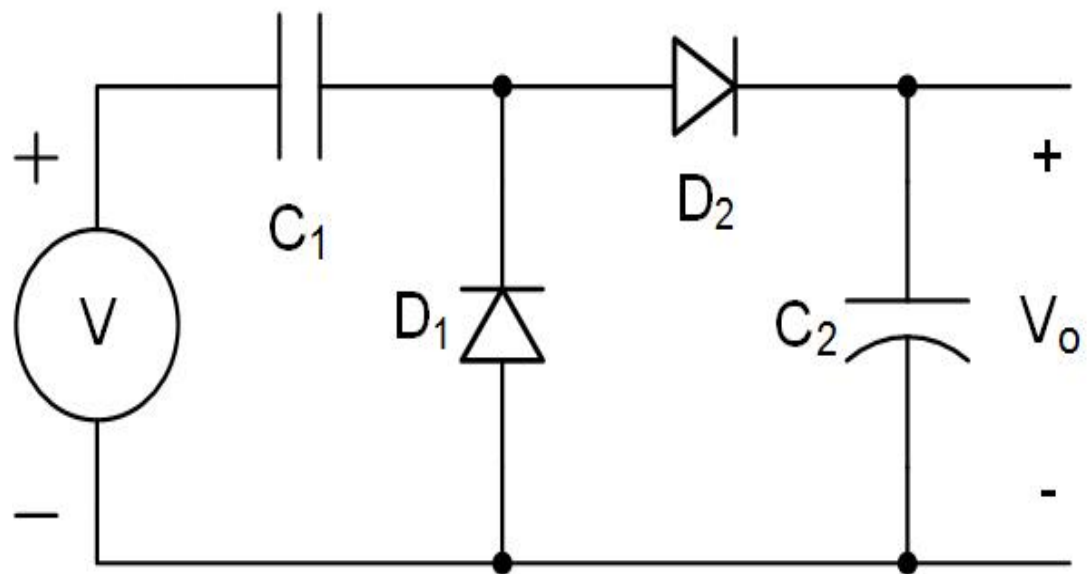
Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Incorrect

Mark 0.0 out of 2.0



For the diode circuit shown, what will the output voltage, V_o , be in volts if the input voltage, V , is a sine wave with an amplitude equal to 11.0V ? Assume that when a diode is turned on the voltage across it will be 0.7V.

Answer: ✗

The correct answer is: 20.6

Incorrect

Marks for this submission: 0.0/2.0.

Question 4

Correct

Mark 2.0 out of 2.0

In a Peak Detector diode circuit, which of the following is true?

Select one:

- ☐ a. The output voltage is always equal to the input voltage
- ☐ b. The diode turns on briefly in the beginning, but then is on most of the time
- ☒ c. The diode must have a breakdown voltage equal to the peak-to-peak input voltage ✓
- ☐ d. None of these
- ☐ e. The charge supplied to the load is replaced by the capacitor each time the input voltage reaches it's peak

The correct answer is: The diode must have a breakdown voltage equal to the peak-to-peak input voltage

Correct

Marks for this submission: 2.0/2.0.

Question 5

Correct

Mark 2.0 out of 2.0

In order to avoid problems with thermal runaway, diodes are usually biased with a constant current instead of at a constant voltage.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Started on Wednesday, 11 October 2017, 2:21 PM

State Finished

Completed on Wednesday, 11 October 2017, 2:31 PM

Time taken 9 mins 28 secs

Grade 4.0 out of 10.0 (40%)

Question 1

Correct

Mark 1.0 out of 2.0

Which of the following would cause the ripple voltage at the output of a power supply to increase?

Select one:

- ☐ a. Increasing the size of the filter capacitor
- ☐ b. Increasing the frequency of the input voltage
- ☐ c. None of these
- ☒ d. Increasing the amplitude of the input voltage ✓
- ☐ e. Increasing the size of the load resistance

The correct answer is: Increasing the amplitude of the input voltage

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 0.0 out of 2.0

Center-tapped transformers are often used in power supplies instead of bridge rectifiers to lower cost.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Correct

Mark 2.0 out of 2.0

A half-wave diode rectifier circuit is driven by a 60Hz sine wave with a peak value of 10V. If the load resistance this circuit drives is $8.0\text{k}\Omega$ and the maximum ripple voltage allowed at the output is $0.16\text{ V}_{\text{peak-to-peak}}$, then what must the minimum value be for the filter capacitor in microFarads?

Answer: ✓

The correct answer is: 130

Correct

Marks for this submission: 2.0/2.0.

Question 4

Correct

Mark 1.0 out of 2.0

Which of the of the following is true for a diode with a voltage V_d applied to the P side and the N side grounded?

Select one:

- ☐ a. The current through the diode, I_d , grows linearly when V_d is increased slightly above 0V
- ☐ b. All of these
- ☐ c. The diode “turns on” and starts carrying a significant amount of current when V_d is $< -0.5V$
- ☐ d. The current through the diode, I_d , grows exponentially when V_d is decreased slightly below 0V
- ☒ e. The current through the diode, I_d , grows linearly when V_d is decreased below the breakdown voltage ✓

The correct answer is: The current through the diode, I_d , grows linearly when V_d is decreased below the breakdown voltage

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 0.0 out of 2.0

One of the most useful applications for diodes is in DC power supplies, which convert a DC input voltage into an AC output voltage.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on Wednesday, 11 October 2017, 2:40 PM

State Finished

Completed on Wednesday, 11 October 2017, 2:59 PM

Time taken 19 mins 19 secs

Grade 7.0 out of 10.0 (70%)

Question 1

Correct

Mark 1.0 out of 2.0

Which of the following will give the most accurate results when analyzing diode circuits?

Select one:

- ☐ a. None of these
- ☐ b. The ideal diode model
- ☒ c. Iterative analysis using the exponential diode model ✓
- ☐ d. Graphical analysis using a load line
- ☐ e. The constant voltage drop diode model

The correct answer is: Iterative analysis using the exponential diode model

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

Zener diodes are intentionally designed to operate in their reverse breakdown region so they can be used as voltage references.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Correct

Mark 2.0 out of 2.0

A full-wave diode rectifier circuit is driven by a 60Hz sine wave with a peak value of 11V. If the load resistance this circuit drives is $6.3\text{k}\Omega$ and the ripple voltage at the output is $0.26\text{ V}_{\text{peak-to-peak}}$, then what is the average current in the diode in milliamps?

Answer: ✓

The correct answer is: 27.0

Correct

Marks for this submission: 2.0/2.0.

Question 4

Correct

Mark 2.0 out of 2.0

Which of the following is true about the small-signal model for a reverse biased diode?

Select one:

- ☐ a. None of these
- ☐ b. The small-signal model is valid for any amount of reverse bias voltage
- ☐ c. The small-signal model is valid for any amount of reverse bias current
- ☐ d. The incremental resistance of the diode is equal to the slope of the diode I-V curve
- ☒ e. The reverse diode voltage equals the battery voltage plus the current times the incremental resistance ✓

The correct answer is: The reverse diode voltage equals the battery voltage plus the current times the incremental resistance

Correct

Marks for this submission: 2.0/2.0.

Question 5

Correct

Mark 0.0 out of 2.0

A large enough piece of anything nonlinear looks linear.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on Wednesday, 11 October 2017, 3:00 PM

State Finished

Completed on Wednesday, 11 October 2017, 3:56 PM

Time taken 55 mins 40 secs

Grade 5.0 out of 10.0 (50%)

Question 1

Correct

Mark 1.0 out of 2.0

If a diode at 300°K with a constant bias current of 1mA has a forward voltage of 700mV across it, what will the voltage drop across this same diode be if the bias current is decreased to 10μA?

Select one:

- ☐ a. 820mV
- ☐ b. 640mV
- ☐ c. None of these
- ☐ d. 760mV
- ☒ e. 580mV ✓

The correct answer is: 580mV

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 0.0 out of 2.0

The peak current which flows in the rectifier diodes for a power supply is often much smaller than the current supplied to the load.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

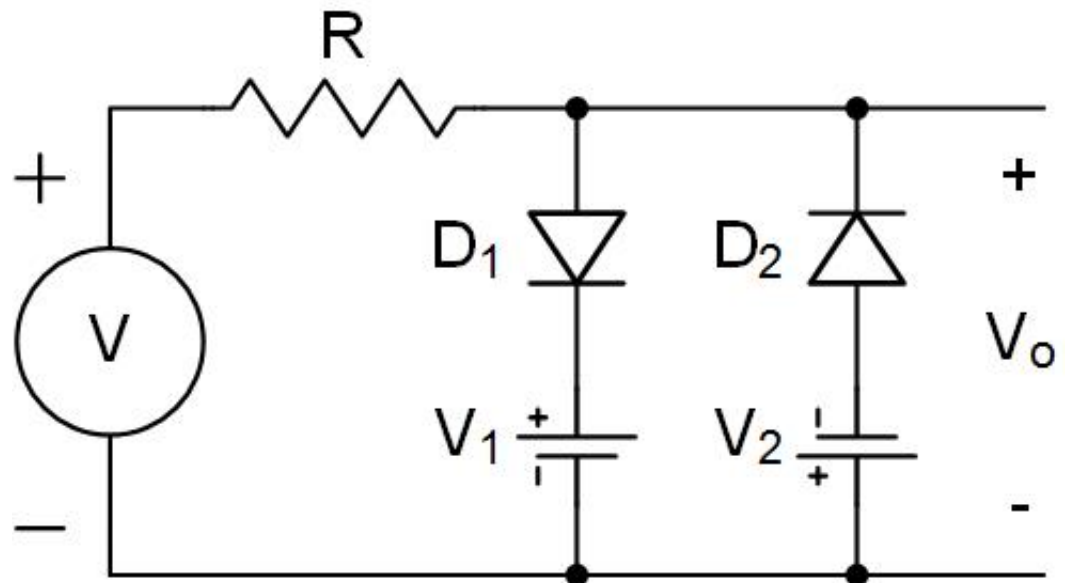
Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Not answered

Mark 0.0 out of 2.0



For the diode circuit shown, what will the output voltage, V_o , be in volts if the input voltage, V , is equal to 8V ? Assume that when a diode is turned on the voltage across it will be 0.7V, and for the batteries use $V_1 = 5.9\text{V}$ and $V_2 = 7.1\text{V}$. Also use $R = 3.2\text{k}\Omega$.

Answer: ✗

The correct answer is: 6.60

Question 4

Correct

Mark 2.0 out of 2.0

When is the current flowing through a diode approximately constant?

Select one:

- ☐ a. When the voltage on the N side is higher than the voltage on the P side, and higher than the breakdown voltage
- ☒ b. When the voltage on the N side is higher than the voltage on the P side, but lower than the breakdown voltage ✓
- ☐ c. None of these
- ☐ d. When the voltage on the P side is higher than the voltage on the N side
- ☐ e. When the voltage on the P side is higher than the voltage on the N side by at least 500mV

The correct answer is: When the voltage on the N side is higher than the voltage on the P side, but lower than the breakdown voltage

Correct

Marks for this submission: 2.0/2.0.

Question 5

Correct

Mark 2.0 out of 2.0

When a small reverse bias voltage is applied across a diode, the diode only conducts a small forward current called the saturation current.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

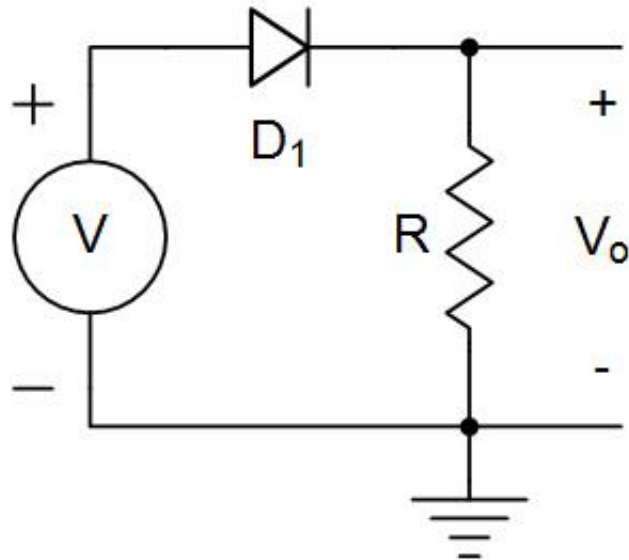
Correct

Marks for this submission: 2.0/2.0.

Question 1

Correct

Mark 1.0 out of 2.0



The diode circuit shown is a :

Select one:

- ☐ a. Voltage doubler circuit
- ☐ b. Limiter circuit
- ☒ c. None of these ✓
- ☐ d. Peak detector circuit
- ☐ e. DC restorer circuit

The correct answer is: None of these

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

When performing a Load Line analysis on a diode circuit to find the bias point, the operating point for the diode is where the linear equation for the circuit and the diode's nonlinear I-V characteristic curve both cross the X-axis on the plot.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

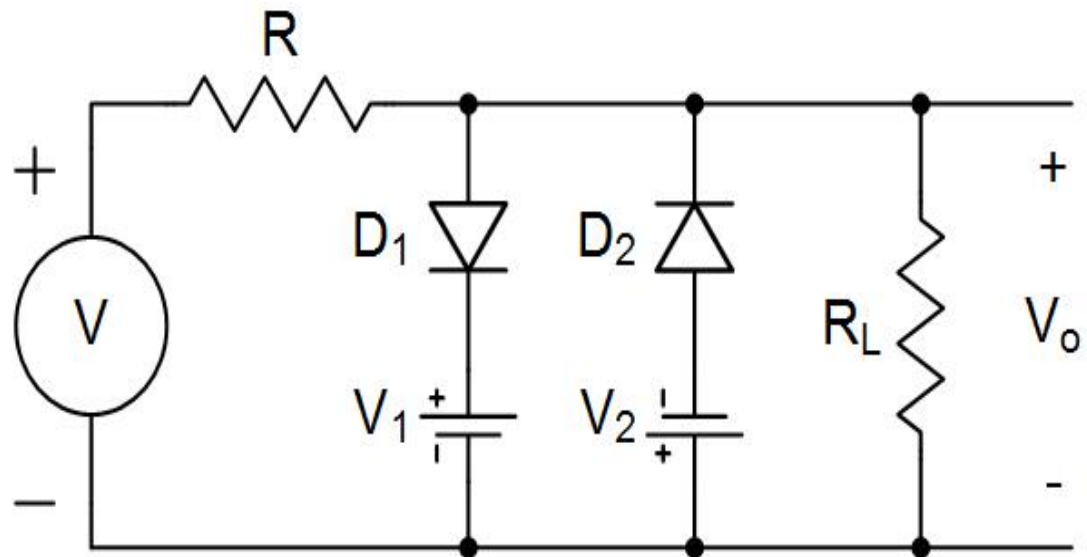
Correct

Marks for this submission: 2.0/2.0.

Question 3

Not answered

Mark 0.0 out of 2.0



For the diode circuit shown, what will the output voltage, V_o , be in volts if the input voltage, V , is equal to -14V ? Assume that when a diode is turned on the voltage across it will be 0.7V , and for the batteries use $V_1 = 8.8\text{V}$ and $V_2 = 6.6\text{V}$. Also use $R = 2.5\text{k}\Omega$ and $R_L = 13.4\text{k}\Omega$.

Answer: ✗

The correct answer is: -7.30

Question 4

Correct

Mark 0.0 out of 2.0

If a diode at 300°K with a constant bias current of 1mA has a forward voltage of 700mV across it, what will the voltage drop across this same diode be if the bias current is decreased to 1μA?

Select one:

- ☐ a. 820mV
- ☒ b. None of these ✓
- ☐ c. 760mV
- ☐ d. 580mV
- ☐ e. 640mV

The correct answer is: None of these

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 5

Correct

Mark 0.0 out of 2.0

Peak Detectors are often used to create an output voltage which is equal to the average value of an input signal.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on Wednesday, 11 October 2017, 4:02 PM

State Finished

Completed on Wednesday, 11 October 2017, 4:16 PM

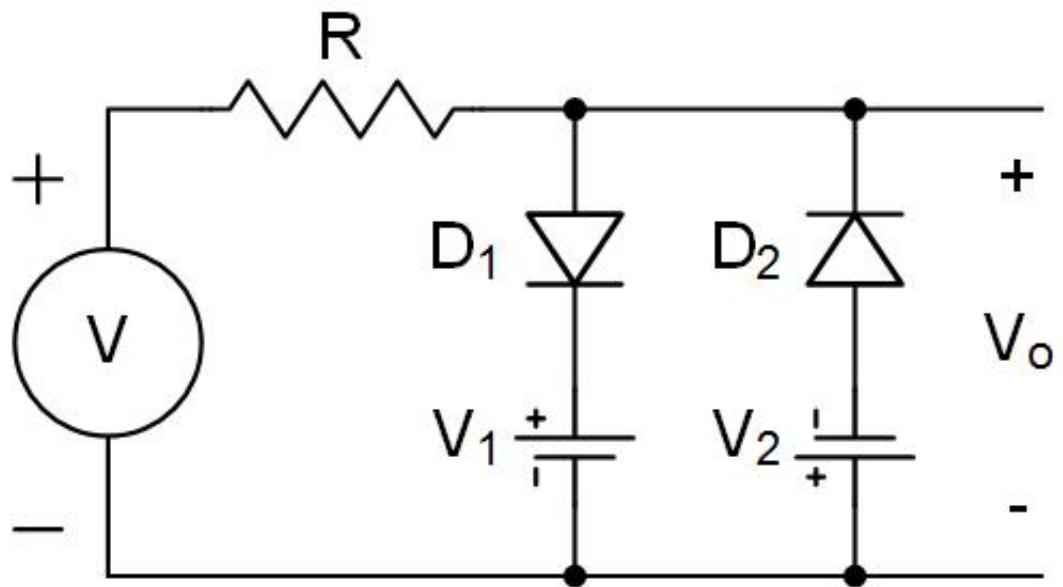
Time taken 14 mins 4 secs

Grade 6.0 out of 10.0 (60%)

Question 1

Correct

Mark 2.0 out of 2.0



Assuming ideal diodes, for the diode circuit shown :

Select one:

- ☐ a. The minimum output voltage is $-V_2$
- ☐ b. The gain is equal to 0 when V is $> +V_1$, or $< -V_2$
- ☒ c. All of these ✓
- ☐ d. The maximum output voltage is $+V_1$
- ☐ e. The gain is equal to 1 when V is $< +V_1$ and $> -V_2$

The correct answer is: All of these

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 2.0 out of 2.0

The RC time constant for the filter capacitor in a power supply is typically set so large that the capacitor discharge appears linear.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Incorrect

Mark 0.0 out of 2.0

A full-wave diode rectifier circuit is driven by a 60Hz sine wave with a peak value of 19V. If the load resistance this circuit drives is $9.5\text{k}\Omega$ and the ripple voltage at the output is 0.36 V_{peak-to-peak}, then what is the peak current in the diode in milliamps?

Answer: ✗

The correct answer is: 66.6

Incorrect

Marks for this submission: 0.0/2.0.

Question 4

Incorrect

Mark 0.0 out of 2.0

If a diode at 25°C with a constant bias current of 100μA has a forward voltage of 700mV across it, what will the voltage drop across this same diode be at 75°C ?

Select one:

- ☐ a. 600mV
- ☒ b. 750mV ✖
- ☐ c. None of these
- ☐ d. 800mV
- ☐ e. 650mV

The correct answer is: 600mV

Incorrect

Marks for this submission: 0.0/2.0.

Question 5

Correct

Mark 2.0 out of 2.0

Superposition can be used to analyze nonlinear devices such as diodes as long as the variations around the bias point are large enough.

Select one:

- ☐ True
- ☒ False ✔

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0.

Started on Wednesday, 11 October 2017, 4:17 PM

State Finished

Completed on Wednesday, 11 October 2017, 4:25 PM

Time taken 7 mins 44 secs

Grade 7.0 out of 10.0 (70%)

Question 1

Correct

Mark 2.0 out of 2.0

If a diode at 75°C with a constant bias current of 100μA has a forward voltage of 700mV across it, what will the voltage drop across this same diode be at 25°C ?

Select one:

- ☐ a. None of these
- ☐ b. 600mV
- ☐ c. 650mV
- ☐ d. 750mV
- ☒ e. 800mV ✓

The correct answer is: 800mV

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 0.0 out of 2.0

Once a Zener diode breaks down in the reverse direction, the voltage across it only changes slightly as the current through it varies.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Correct

Mark 2.0 out of 2.0

A half-wave diode rectifier circuit is driven by a 60Hz sine wave with a peak value of 15V. If the load resistance this circuit drives is $5.4\text{k}\Omega$ and the ripple voltage at the output is 0.15 V_{peak-to-peak}, then what is the average current in the diode in milliamps?

Answer: ✓

The correct answer is: 126.2

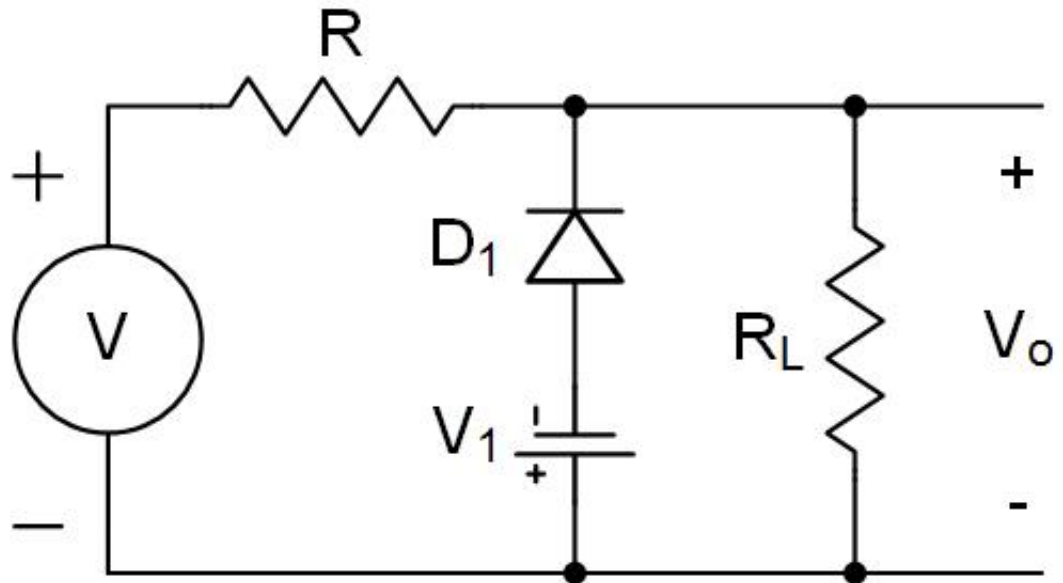
Correct

Marks for this submission: 2.0/2.0.

Question 4

Correct

Mark 1.0 out of 2.0



Assuming ideal diodes, for the diode circuit shown :

Select one:

- ☒ a. All of these ✓
- ☐ b. The minimum output voltage is $-V_1$
- ☐ c. The gain is equal to $R_L/(R+R_L)$ when V is $> -V_1$
- ☐ d. The gain is equal to 0 when V is $< -V_1$
- ☐ e. The maximum output voltage is not limited

The correct answer is: All of these

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 2.0 out of 2.0

A Half Wave Rectifier allows only the positive or negative peaks of the input sine wave through to the output, but not both.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Started on Wednesday, 11 October 2017, 4:25 PM

State Finished

Completed on Wednesday, 11 October 2017, 4:33 PM

Time taken 7 mins 7 secs

Grade 6.0 out of 10.0 (60%)

Question 1

Correct

Mark 2.0 out of 2.0

If a diode at 25°C with a constant bias current of 100μA has a forward voltage of 700mV across it, what will the voltage drop across this same diode be at 50°C ?

Select one:

- ☐ a. 750mV
- ☐ b. 600mV
- ☒ c. 650mV ✓
- ☐ d. 800mV
- ☐ e. None of these

The correct answer is: 650mV

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 2.0 out of 2.0

As the bias current flowing through a forward biased silicon diode at room temperature increases, the voltage across the diode will increase at a rate of about 60mV per decade of current increase.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

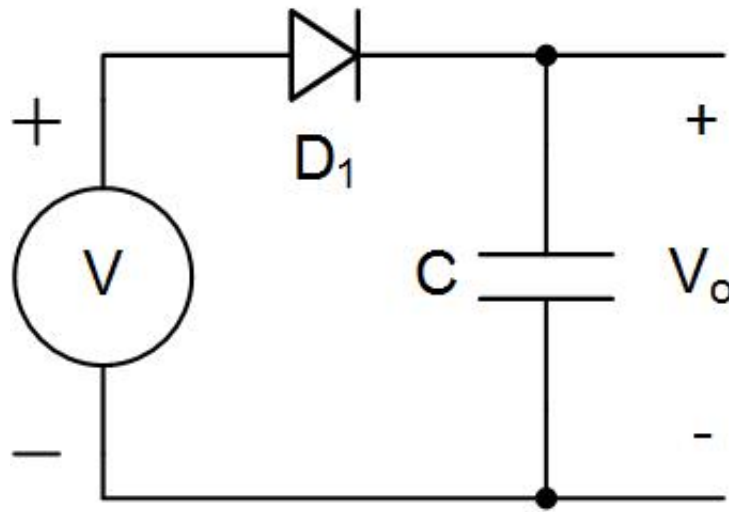
Correct

Marks for this submission: 2.0/2.0.

Question 3

Correct

Mark 1.0 out of 2.0



For the diode circuit shown, what will the output voltage, V_o , be in volts if the input voltage, V , is a sine wave with an amplitude equal to 2.9V ? Assume that when the diode is turned on the voltage across it will be 0.7V.

Answer: 2.2 ✓

The correct answer is: 2.2

CorrectMarks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 4

Correct

Mark 1.0 out of 2.0

In a Voltage Doubler diode circuit, which of the following is true?

Select one:

- ☐ a. One of the diodes and one of the capacitors implement a rectifier circuit
- ☐ b. All of these
- ☒ c. The diodes must have a breakdown voltage larger than the peak-to-peak input voltage ✓
- ☐ d. The output will be a sine wave with a peak of either +2 or -2 times the peak input voltage, depending on the direction of the diodes
- ☐ e. One of the diodes and one of the capacitors implement a limiter circuit

The correct answer is: The diodes must have a breakdown voltage larger than the peak-to-peak input voltage

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 0.0 out of 2.0

A Voltage Doubler circuit can be built by combining a clamped capacitor circuit with a DC restorer circuit.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on Wednesday, 11 October 2017, 4:41 PM

State Finished

Completed on Wednesday, 11 October 2017, 4:50 PM

Time taken 9 mins 17 secs

Grade 4.0 out of 10.0 (40%)

Question 1

Correct

Mark 1.0 out of 2.0

Which of the following is true about the small-signal model for a reverse biased diode?

Select one:

- ☐ a. The reverse diode voltage is equal to the battery voltage for all values of current
- ☐ b. All of these
- ☒ c. The small-signal model is valid for reverse bias currents $>$ the knee current, I_{zk} ✓
- ☐ d. The small-signal model is valid for any amount of reverse bias voltage
- ☐ e. The incremental resistance of the diode is equal to the slope of the diode I-V curve

The correct answer is: The small-signal model is valid for reverse bias currents $>$ the knee current, I_{zk}

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

Clamped Capacitor circuits can be used to restore DC values to AC coupled signals.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

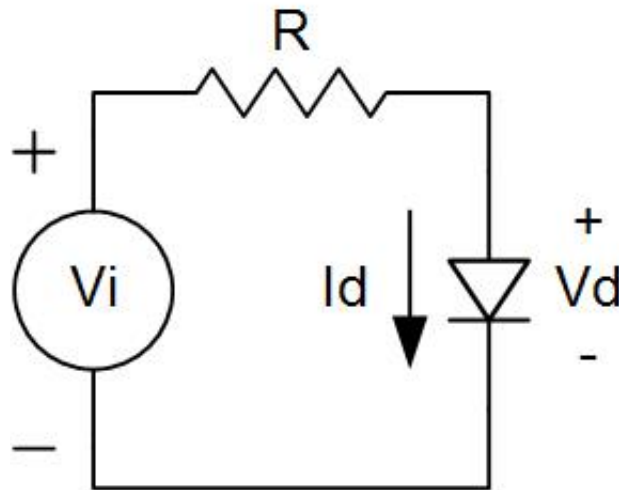
Correct

Marks for this submission: 2.0/2.0.

Question 3

Not answered

Mark 0.0 out of 2.0



In the diode circuit shown the value for R was chosen to set the DC bias current, I_d , equal to 8.7 mA by using the constant voltage model for the diode with $V_d = 700\text{mV}$. If the actual voltage across the diode is 673mV, then what will the percent error be in the actual DC bias current compared to the intended value? Use $V_i = 10.2\text{V}$.

Answer: ✗

The correct answer is: 0.28

Question 4

Correct

Mark 1.0 out of 2.0

In a Voltage Doubler diode circuit, which of the following is true?

Select one:

- ☐ a. None of these
- ☐ b. The output will be a sine wave with a peak of either +2 or -2 times the peak input voltage, depending on the direction of the diodes
- ☐ c. The diodes must have a breakdown voltage equal to the peak input voltage
- ☒ d. One of the diodes and one of the capacitors implement a peak detector circuit ✓
- ☐ e. One of the diodes and one of the capacitors implement a rectifier circuit

The correct answer is: One of the diodes and one of the capacitors implement a peak detector circuit

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 0.0 out of 2.0

As temperature increases the voltage across a forward biased silicon diode will increase.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on Thursday, 12 October 2017, 12:11 PM

State Finished

Completed on Thursday, 12 October 2017, 12:17 PM

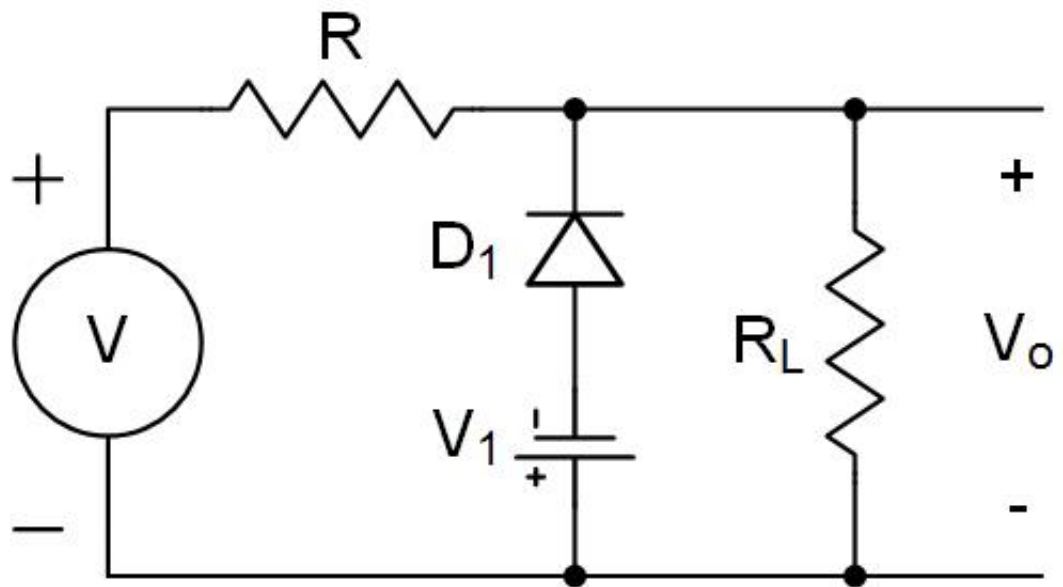
Time taken 5 mins 36 secs

Grade 5.0 out of 10.0 (50%)

Question 1

Correct

Mark 2.0 out of 2.0



Assuming ideal diodes, for the diode circuit shown :

Select one:

- ☐ a. The maximum output voltage is $+V_1$
- ☐ b. The gain is equal to 0 when V is $> -V_1$
- ☐ c. The minimum output voltage is $+V_1$
- ☒ d. The gain is equal to 0 when V is $< -V_1$ ✓
- ☐ e. None of these

The correct answer is: The gain is equal to 0 when V is $< -V_1$

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 0.0 out of 2.0

A Load Line analysis is a graphical solution method which allows a nonlinear set of simultaneous equations to be solved, by plotting the linear equation for the circuit on the same plot with the diode's nonlinear I-V characteristic curve.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

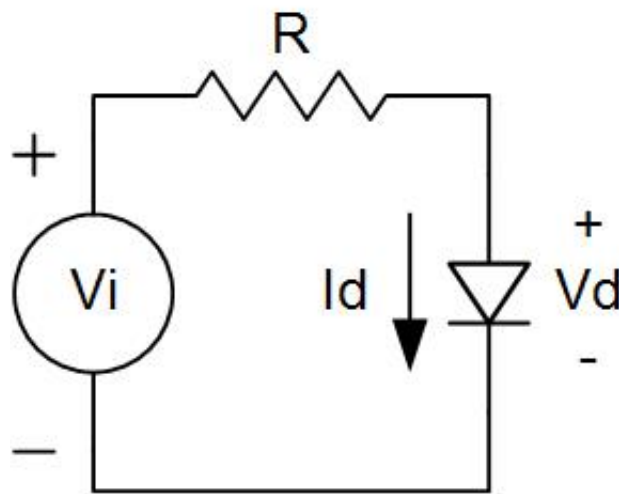
Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Not answered

Mark 0.0 out of 2.0



What is the DC bias current, I_d , in milliamps for the diode circuit shown? Use the ideal diode model, and assume that $V_i = 13.0\text{V}$ and $R = 1.3\text{k}\Omega$.

Answer: ✗

The correct answer is: 10.00

Question 4

Correct

Mark 1.0 out of 2.0

Which of the following is true for the small-signal resistance of a forward biased diode?

Select one:

- ☐ a. The small-signal resistance of a diode decreases as the temperature increases
- ☐ b. The small-signal resistance of a diode models the resistance of the silicon used to build the diode
- ☐ c. All of these
- ☐ d. The small-signal resistance of a diode is equal to the slope of the diode I-V curve
- ☒ e. The small-signal resistance of a diode decreases as the bias current increases ✓

The correct answer is: The small-signal resistance of a diode decreases as the bias current increases

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 2.0 out of 2.0

In a power supply a transformer is typically used to reduce the high line voltage to a more useful, lower value.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Started on Thursday, 12 October 2017, 12:17 PM

State Finished

Completed on Thursday, 12 October 2017, 12:20 PM

Time taken 3 mins 5 secs

Grade 3.0 out of 10.0 (30%)

Question 1

Correct

Mark 2.0 out of 2.0

Which of the following circuits is part of a typical DC power supply?

Select one:

- ☐ a. None of these
- ☐ b. A load resistor
- ☐ c. A current regulator
- ☐ d. A diode limiter
- ☒ e. A low pass filter ✓

The correct answer is: A low pass filter

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 0.0 out of 2.0

The output voltage for a bridge rectifier is just slightly lower than the output voltage for a full wave rectifier which uses a center-tapped transformer.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

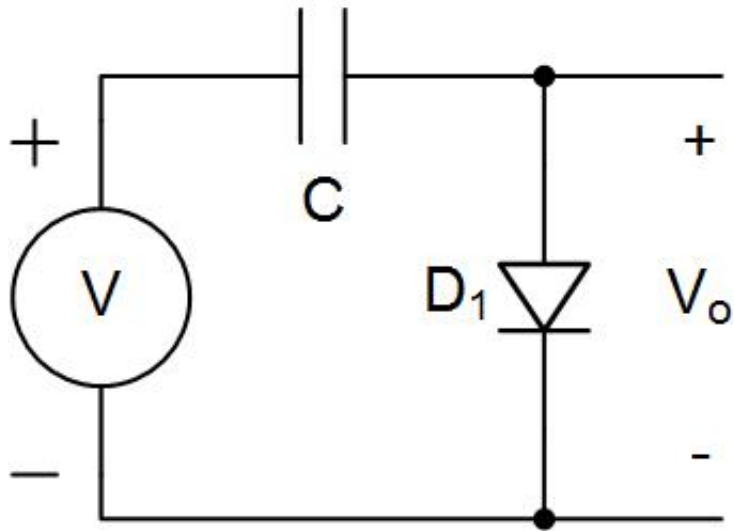
Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Incorrect

Mark 0.0 out of 2.0



For the diode circuit shown, what will the minimum output voltage, V_o , be in volts if the input voltage, V , is a square wave which varies between +1.8V and -4.2V ?

Assume that when the diode is turned on the voltage across it will be 0.7V.

Answer: 0.7



The correct answer is: -5.3

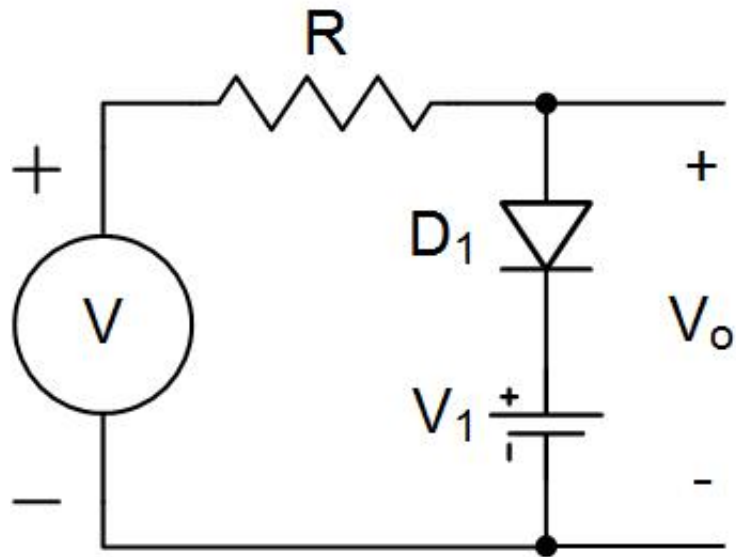
Incorrect

Marks for this submission: 0.0/2.0.

Question 4

Correct

Mark 1.0 out of 2.0



Assuming ideal diodes, for the diode circuit shown :

Select one:

- ☐ a. The minimum output voltage is $+V_1$
- ☐ b. The gain is equal to 1 when V is $> +V_1$
- ☐ c. All of these
- ☐ d. The maximum output voltage is $-V_1$
- ☒ e. The gain is equal to 1 when V is $< +V_1$ ✓

The correct answer is: The gain is equal to 1 when V is $< +V_1$

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 0.0 out of 2.0

In a rectifier the diodes only turn off for a short conduction interval every cycle to replace the charge which the filter capacitor supplied to the load while the diodes were turned on.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on Thursday, 12 October 2017, 12:21 PM

State Finished

Completed on Thursday, 12 October 2017, 12:26 PM

Time taken 4 mins 57 secs

Grade 6.0 out of 10.0 (60%)

Question 1

Correct

Mark 1.0 out of 2.0

When does the current flowing through a diode depend linearly on the voltage applied across the diode?

Select one:

- ☐ a. When the voltage on the P side is higher than the voltage on the N side by at least 500mV
- ☐ b. All of these
- ☐ c. When the voltage on the P side is higher than the voltage on the N side
- ☒ d. When the voltage on the N side is higher than the voltage on the P side, and higher than the breakdown voltage ✓
- ☐ e. When the voltage on the N side is higher than the voltage on the P side, but lower than the breakdown voltage

The correct answer is: When the voltage on the N side is higher than the voltage on the P side, and higher than the breakdown voltage

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

In the small-signal equivalent for a circuit containing a reverse biased Zener diode, the DC battery is used to model the diode's reverse breakdown voltage at low current levels.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

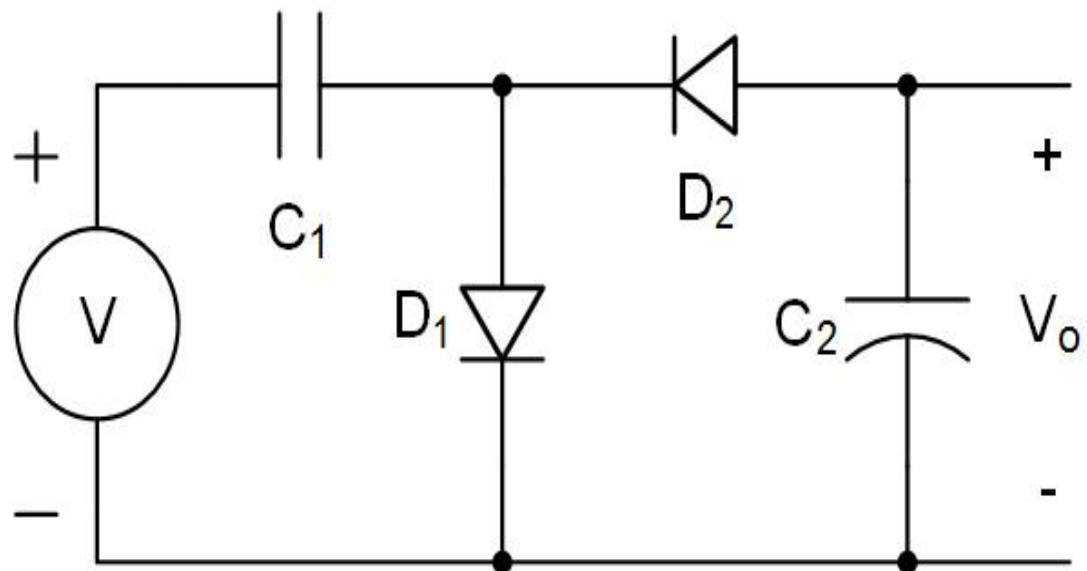
Correct

Marks for this submission: 2.0/2.0.

Question 3

Not answered

Mark 0.0 out of 2.0



For the diode circuit shown, what will the output voltage, V_o , be in volts if the input voltage, V , is a sine wave with an amplitude equal to 10.1V ? Assume that when a diode is turned on the voltage across it will be 0.7V.

Answer: ✗

The correct answer is: -18.8

Question 4

Correct

Mark 1.0 out of 2.0

Which of the following is true for the small-signal resistance of a forward biased diode?

Select one:

- ☐ a. None of these
- ☐ b. The small-signal resistance of a diode models the resistance of the silicon used to build the diode
- ☐ c. The small-signal resistance of a diode increases as the bias current increases
- ☐ d. The small-signal resistance of a diode decreases as the temperature increases
- ☒ e. The small-signal resistance of a diode can be measured from the slope of the diode I-V curve ✓

The correct answer is: The small-signal resistance of a diode can be measured from the slope of the diode I-V curve

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 2.0 out of 2.0

In a power supply diodes are typically used to rectify the AC input voltage, which means converting a bipolar sine wave into a series of unipolar pulses.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Started on Thursday, 12 October 2017, 12:27 PM

State Finished

Completed on Thursday, 12 October 2017, 12:56 PM

Time taken 29 mins 10 secs

Grade 4.0 out of 10.0 (40%)

Question 1

Correct

Mark 2.0 out of 2.0

Which of the following circuits is part of a typical DC power supply?

Select one:

- ☐ a. All of these
- ☒ b. A voltage regulator ✓
- ☐ c. A high pass filter
- ☐ d. A load resistor
- ☐ e. A diode limiter

The correct answer is: A voltage regulator

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 0.0 out of 2.0

For a Half Wave Rectifier the diode must be able to handle a Peak Inverse Voltage equal to nearly twice the peak of the input voltage.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

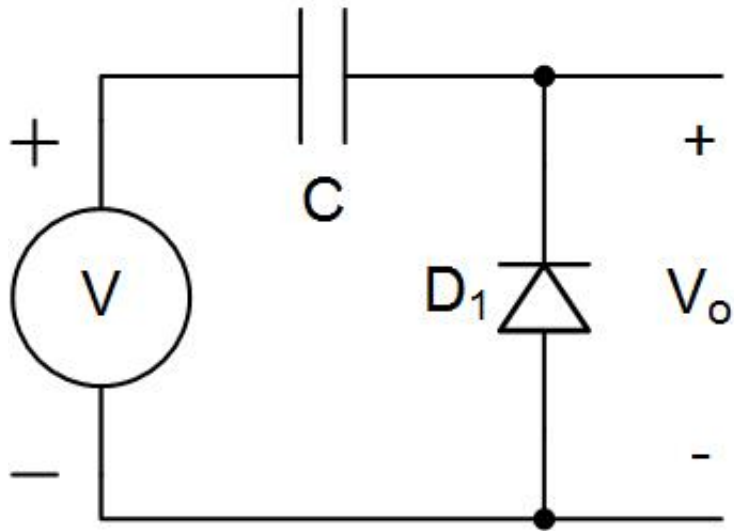
Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Incorrect

Mark 0.0 out of 2.0



For the diode circuit shown, what will the minimum output voltage, V_o , be in volts if the input voltage, V , is a square wave which varies between +3.4V and -7.8V ? Assume that when the diode is turned on the voltage across it will be 0.7V.

Answer: ❌

The correct answer is: -0.7

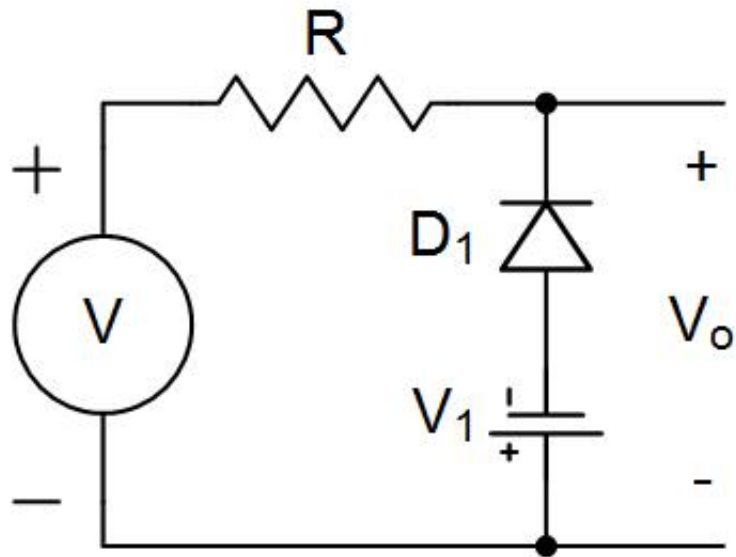
Incorrect

Marks for this submission: 0.0/2.0.

Question 4

Correct

Mark 0.0 out of 2.0



Assuming ideal diodes, for the diode circuit shown :

Select one:

- ☐ a. The minimum output voltage is $+V_1$
- ☐ b. The maximum output voltage is $+V_1$
- ☐ c. The gain is equal to 1 when V is $< -V_1$
- ☐ d. The gain is equal to 0 when V is $> -V_1$
- ☒ e. None of these ✓

The correct answer is: None of these

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 5

Correct

Mark 2.0 out of 2.0

In the small-signal equivalent for a circuit containing a forward biased diode, the diode is replaced by its small-signal resistance which is proportional to the operating temperature.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Started on Thursday, 12 October 2017, 12:57 PM

State Finished

Completed on Thursday, 12 October 2017, 1:01 PM

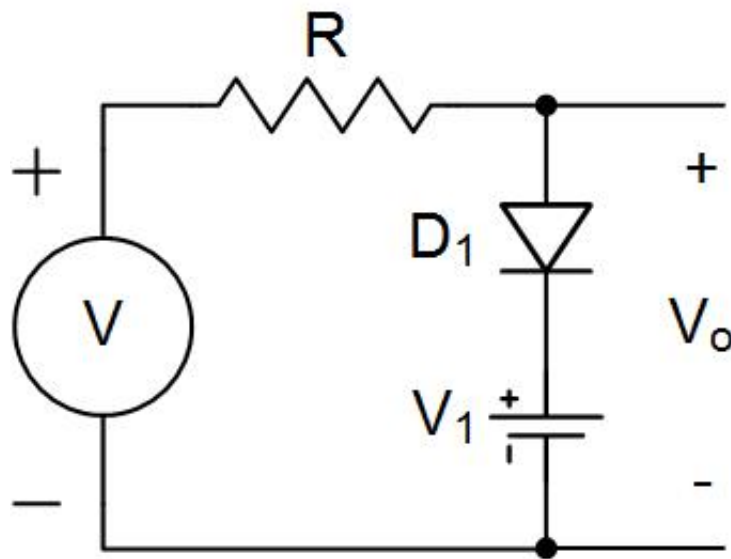
Time taken 3 mins 54 secs

Grade 5.0 out of 10.0 (50%)

Question 1

Correct

Mark 2.0 out of 2.0



Assuming ideal diodes, for the diode circuit shown :

Select one:

- ☐ a. The gain is equal to 1 when V is $> +V_1$
- ☐ b. The maximum output voltage is $-V_1$
- ☐ c. The minimum output voltage is $+V_1$
- ☒ d. None of these ✓
- ☐ e. The gain is equal to 0 when V is $< +V_1$

The correct answer is: None of these

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 0.0 out of 2.0

The voltage across a forward biased silicon diode will change by about $+2\text{mV}/^\circ\text{C}$ as temperature changes.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

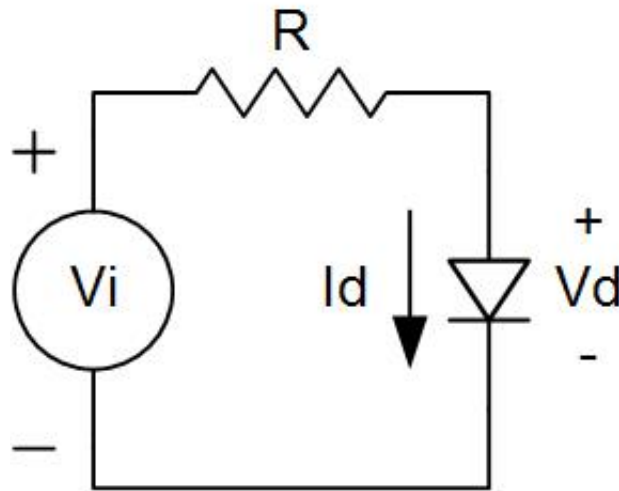
Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Incorrect

Mark 0.0 out of 2.0



What is the DC bias current, I_d , in milliamps for the diode circuit shown? Use the constant voltage model for the diode, and assume that $V_d = 799\text{mV}$. Use $V_i = 9.6\text{V}$ and $R = 3.3\text{k}\Omega$.

Answer: 2.9 ✗

The correct answer is: 2.67

Incorrect

Marks for this submission: 0.0/2.0.

Question 4

Correct

Mark 1.0 out of 2.0

Which of the following is true for the small-signal resistance of a forward biased diode?

Select one:

- ☐ a. The small-signal resistance of a diode models the resistance of the silicon used to build the diode
- ☐ b. The small-signal resistance of a diode increases as the bias current increases
- ☐ c. The small-signal resistance of a diode decreases as the temperature increases
- ☐ d. The small-signal resistance of a diode is equal to the slope of the diode I-V curve
- ☒ e. None of these ✓

The correct answer is: None of these

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 2.0 out of 2.0

The incremental resistance for a Zener diode is the reciprocal of the slope of the diode's I-V characteristic curve as the reverse voltage across the diode increases above the diode's reverse breakdown voltage.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Started on Thursday, 12 October 2017, 1:02 PM

State Finished

Completed on Thursday, 12 October 2017, 1:06 PM

Time taken 3 mins 46 secs

Grade 5.0 out of 10.0 (50%)

Question 1

Correct

Mark 1.0 out of 2.0

In a DC Restorer diode circuit, which of the following is true?

Select one:

- ☐ a. None of these
- ☐ b. The average value of the output voltage is always equal to zero
- ☒ c. The capacitor charges up to either the peak positive or peak negative input voltage, depending on the direction of the diode ✓
- ☐ d. The peak-to-peak output voltage is equal to the peak input voltage
- ☐ e. The capacitor clamps one side of the diode to a fixed voltage, such as ground

The correct answer is: The capacitor charges up to either the peak positive or peak negative input voltage, depending on the direction of the diode

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

In the small-signal equivalent for a circuit containing a reverse biased Zener diode, the diode is replaced by its small-signal model which is a DC battery in series with the diode's incremental resistance.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

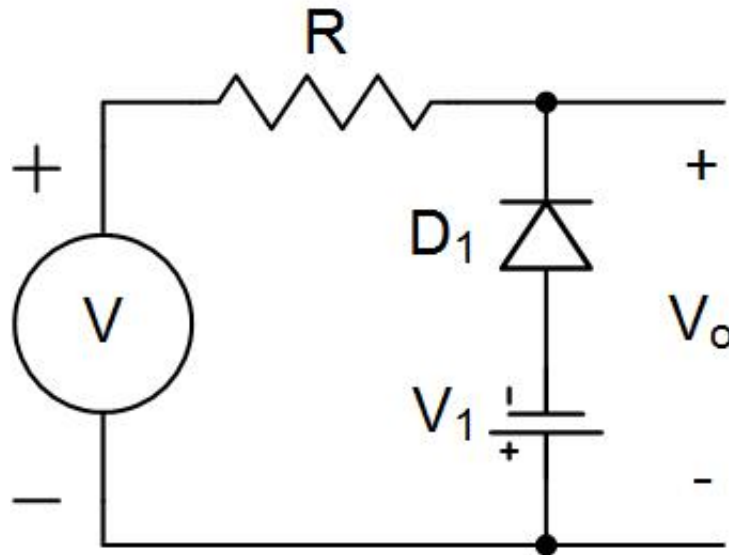
Correct

Marks for this submission: 2.0/2.0.

Question 3

Incorrect

Mark 0.0 out of 2.0



For the diode circuit shown, what will the output voltage, V_o , be in volts if the input voltage, V , is equal to -11V ? Assume that when the diode is turned on the voltage across it will be 0.7V , and for the battery use $V_1 = 8.4\text{V}$. Also use $R = 1.6\text{k}\Omega$.

Answer: ✗

The correct answer is: -9.10

Incorrect

Marks for this submission: 0.0/2.0.

Question 4

Correct

Mark 2.0 out of 2.0

In a Full-wave rectifier which uses a diode bridge, the minimum breakdown voltage required for the diodes is :

Select one:

- ☐ a. The peak input voltage
- ☐ b. The peak-to-peak input voltage minus 1 diode drop
- ☐ c. None of these
- ☒ d. The peak input voltage minus 1 diode drop ✓
- ☐ e. The peak-to-peak input voltage

The correct answer is: The peak input voltage minus 1 diode drop

Correct

Marks for this submission: 2.0/2.0.

Question 5

Correct

Mark 0.0 out of 2.0

Peak Detectors are often used to charge up a capacitor to the maximum value of an input signal.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on Thursday, 12 October 2017, 1:07 PM

State Finished

Completed on Thursday, 12 October 2017, 1:10 PM

Time taken 3 mins 35 secs

Grade 7.0 out of 10.0 (70%)

Question 1

Correct

Mark 1.0 out of 2.0

Which of the of the following is true for a diode with a voltage V_d applied to the P side and the N side grounded?

Select one:

- ☒ a. None of these ✓
- ☐ b. The current through the diode, I_d , grows exponentially when V_d is decreased slightly below 0V
- ☐ c. The current through the diode, I_d , is approximately constant when V_d is decreased below the breakdown voltage
- ☐ d. The diode “turns on” and starts carrying a significant amount of current when V_d is $< -0.5V$
- ☐ e. The current through the diode, I_d , grows linearly when V_d is increased slightly above 0V

The correct answer is: None of these

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

The filter capacitor must be twice as large in a half-wave rectifier than in a full-wave rectifier to obtain the same ripple voltage.

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

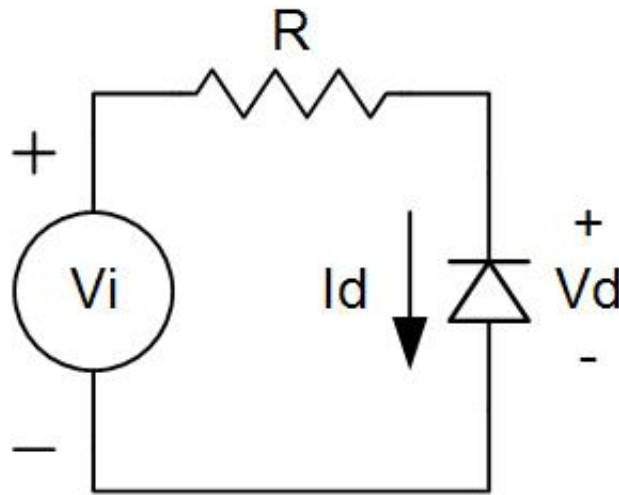
Correct

Marks for this submission: 2.0/2.0.

Question 3

Incorrect

Mark 0.0 out of 2.0



The diode in the circuit shown has a reverse breakdown voltage of $V_z = 7.8\text{V}$ at $I_z = 9.1\text{mA}$ and an incremental resistance of $r_z = 84\Omega$. If this circuit is used as a simple voltage regulator with V_d as the output voltage, then what will the Load Regulation be in mV/mA if a load resistor is attached? Use $V_i = 16.7\text{V}$ and $R = 421\Omega$.

Answer: ✗

The correct answer is: -84.0

Incorrect

Marks for this submission: 0.0/2.0.

Question 4

Correct

Mark 2.0 out of 2.0

In a Peak Detector diode circuit, which of the following is true?

Select one:

- ☐ a. None of these
- ☒ b. The output voltage is equal to the maximum input voltage ✓
- ☐ c. The diode must have a breakdown voltage equal to the peak input voltage
- ☐ d. The diode turns on briefly in the beginning, but then is on most of the time
- ☐ e. The charge supplied to the load is replaced by the capacitor each time the input voltage reaches it's peak

The correct answer is: The output voltage is equal to the maximum input voltage

Correct

Marks for this submission: 2.0/2.0.

Question 5

Correct

Mark 2.0 out of 2.0

To solve a nonlinear circuit equation by iteration, you should use exponentials instead of logarithms to aid in convergence.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0.