

Exam

Name \_\_\_\_\_

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) Reverse current in a diode increases if 1) \_\_\_\_\_  
A) voltage increases B) temperature increases  
C) both A and B D) none of the above

Answer: C

Explanation: A)  
B)  
C)  
D)

- 2) The ripple frequency of a bridge rectifier is 2) \_\_\_\_\_  
A) equal to the input frequency B) double the input frequency  
C) four times the input frequency D) half the input frequency

Answer: B

Explanation: A)  
B)  
C)  
D)

- 3) Assume an ideal diode has a series 10 kΩ resistor and is reverse-biased with a 5.0 V source. The current in the diode is 3) \_\_\_\_\_  
A) 0 mA B) 0.5 mA C) 2.0 mA D) 1.0 mA

Answer: A

Explanation: A)  
B)  
C)  
D)

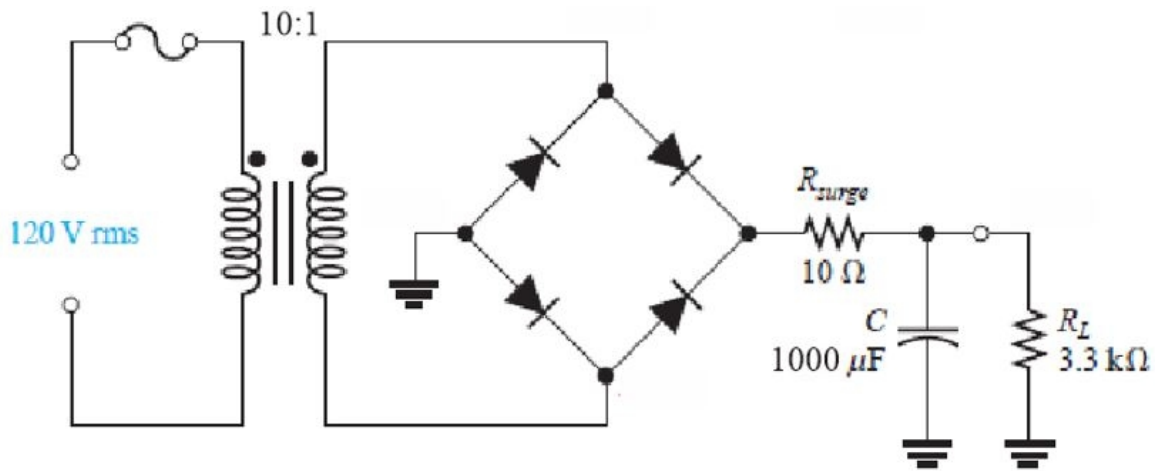


Figure 5

4) Refer to the circuit in Figure 5. The rms primary current is approximately

- A) 5.0 mA                      B) 500 mA                      C) 50 mA                      D) 0.5 mA

Answer: D

Explanation: A)  
B)  
C)  
D)

4) \_\_\_\_\_

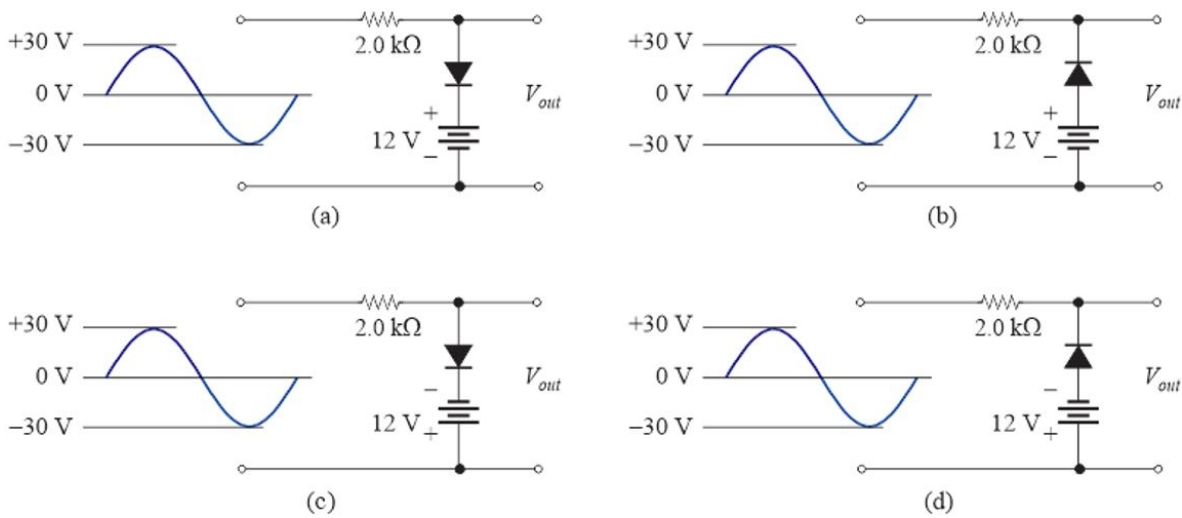


Figure 6

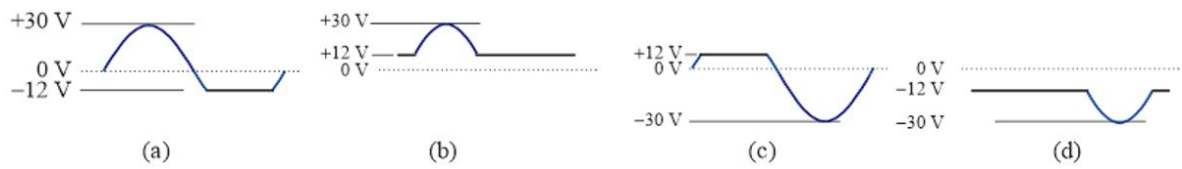


Figure 7

For questions 34, 35, and 36, assume ideal diodes

5) Which circuit in Figure 6 will produce the waveform in Figure 7(c)?

- A) (a)                      B) (b)                      C) (c)                      D) (d)

Answer: A

Explanation: A)  
B)  
C)  
D)

5) \_\_\_\_\_

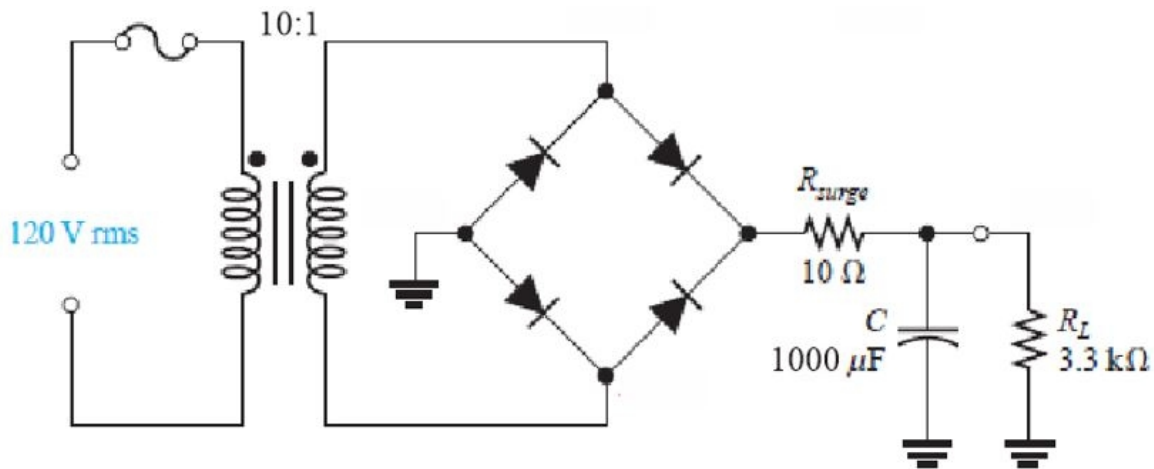


Figure 5

- 6) Refer to the circuit in Figure 5. The purpose of  $R_{surge}$  is to
- A) prevent load current from exceeding safe limits
  - B) prevent overheating the transformer
  - C) prevent an inrush of current that could damage diodes
  - D) all of the above

6) \_\_\_\_\_

Answer: C

Explanation: A)  
B)  
C)  
D)

- 7) The forward resistance of a diode is
- A) constant
  - B) extremely high at all points
  - C) lower above the knee
  - D) lower below the knee

7) \_\_\_\_\_

Answer: C

Explanation: A)  
B)  
C)  
D)

- 8) To convert the rms value of a sine wave to a peak value,
- A) multiply the rms value by 0.637
  - B) divide the rms value by 0.707
  - C) multiply the rms value by 0.707
  - D) divide the rms value by 0.637

8) \_\_\_\_\_

Answer: B

Explanation: A)  
B)  
C)  
D)

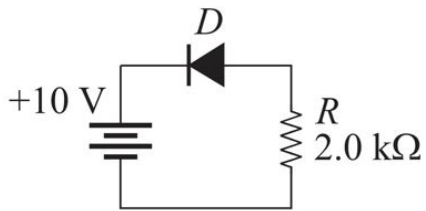


Figure 4

- 9) Refer to Figure 4. Assume the diode is a practical diode. If the diode is reversed, the current in the diode will be 9) \_\_\_\_\_  
 A) 0 mA                                      B) 4.7 mA                                      C) 5.7 mA                                      D) 0.2 mA

Answer: A

Explanation: A)  
 B)  
 C)  
 D)

- 10) The  $V_{RRM}$  specification on a manufacturer's data sheet is the same as the 10) \_\_\_\_\_  
 A) forward voltage at maximum power                                      B) reverse breakdown voltage  
 C) forward voltage with 1 A of current                                      D) PIV

Answer: D

Explanation: A)  
 B)  
 C)  
 D)

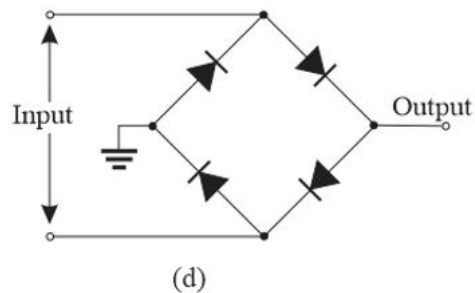
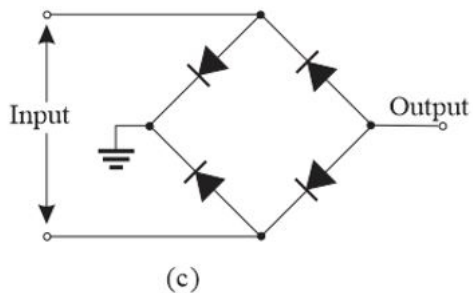
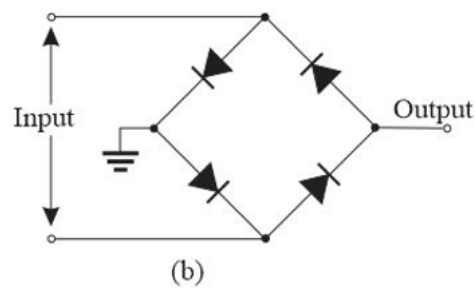
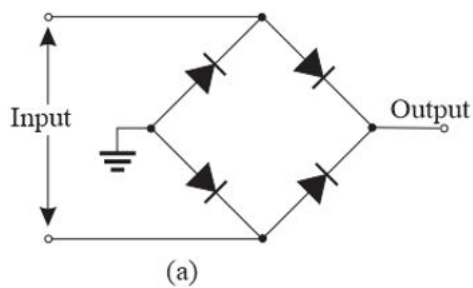


Figure 2

11) Refer to Figure 2. The circuit that will produce a positive output is

- A) (a)                      B) (b)                      C) (c)                      D) (d)

11) \_\_\_\_\_

Answer: A

Explanation: A)  
B)  
C)  
D)

12) A capacitor filtered half-wave rectifier has a ripple frequency that is

- A) half that of the input frequency                      B) twice that of the input frequency  
C) the same as the input frequency                      D) 1.5 times the input frequency

12) \_\_\_\_\_

Answer: C

Explanation: A)  
B)  
C)  
D)

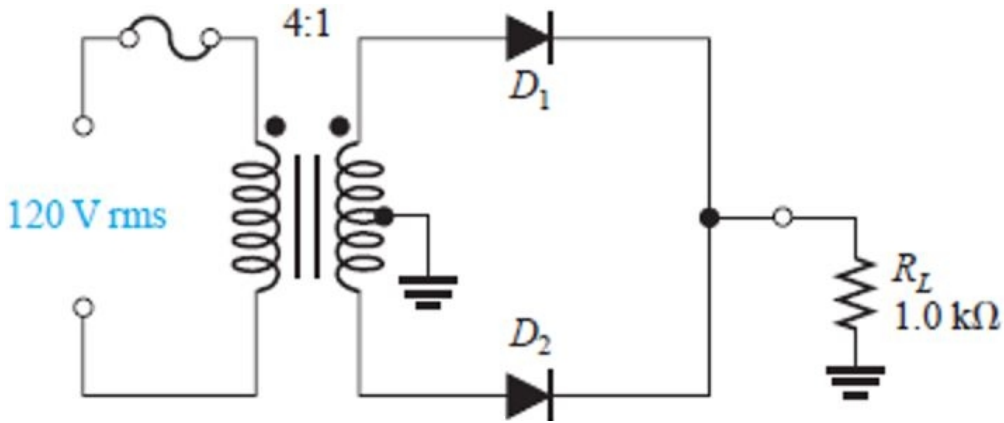


Figure 1

- 13) The circuit in Figure 1 is a 13) \_\_\_\_\_  
 A) clamping circuit B) bridge rectifier  
 C) center-tapped full-wave rectifier D) half-wave rectifier

Answer: C

- Explanation: A)  
 B)  
 C)  
 D)

- 14) A voltage regulator compensates for changes in 14) \_\_\_\_\_  
 A) temperature effects B) load conditions  
 C) input voltage changes D) all of the above

Answer: D

- Explanation: A)  
 B)  
 C)  
 D)

- 15) Another name for a diode limiter circuit is 15) \_\_\_\_\_  
 A) clipper B) clamper C) dc restorer D) rectifier

Answer: A

- Explanation: A)  
 B)  
 C)  
 D)

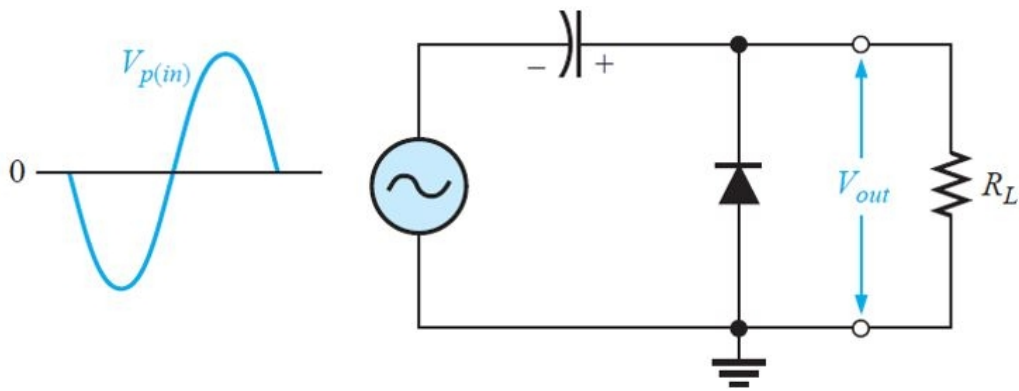


Figure 8

- 16) The circuit in Figure 8 is a 16) \_\_\_\_\_  
 A) negative clipping circuit B) negative clamping circuit  
 C) positive clipping circuit D) positive clamping circuit

Answer: D

- Explanation: A)  
 B)  
 C)  
 D)

- 17) A capacitor filtered full-wave rectifier has a ripple frequency that is 17) \_\_\_\_\_  
 A) 1.5 times the input frequency B) twice that of the input frequency  
 C) the same as the input frequency D) half that of the input frequency

Answer: B

- Explanation: A)  
 B)  
 C)  
 D)

- 18) The ideal dc output voltage of a capacitor-input filter equals the 18) \_\_\_\_\_  
 A) one-half of the peak of the rectified voltage  
 B) average value of the rectified voltage  
 C) peak value of the rectified voltage  
 D) rms value of the rectified voltage

Answer: C

- Explanation: A)  
 B)  
 C)  
 D)

- 19) In a full wave bridge rectifier with a capacitor filter, assume a diode has opened. You expect to see 19) \_\_\_\_\_  
 A) an increase in the ripple frequency B) an increase in the ripple voltage  
 C) both A and B D) none of the above

Answer: B

- Explanation: A)  
 B)  
 C)  
 D)



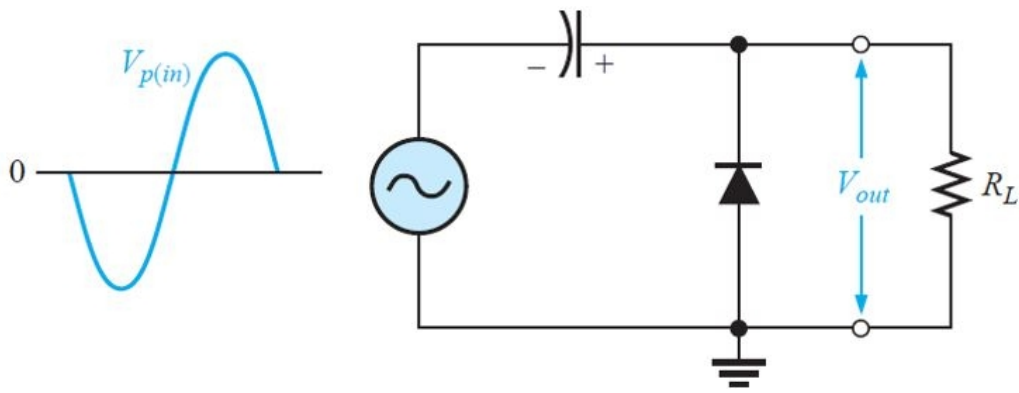


Figure 8

- 20) The maximum output voltage for the circuit in Figure 8 is approximately (Assume an ideal diode.) 20) \_\_\_\_\_  
 A)  $V_{p(in)}$                       B)  $2V_{p(in)}$                       C)  $-V_{p(in)}$                       D) 0 V

Answer: B

- Explanation: A)  
 B)  
 C)  
 D)

- 21) The component(s) immediately preceding the voltage regulation stage in a power supply is 21) \_\_\_\_\_  
 A) a filter capacitor                      B) the fuse  
 C) the transformer                      D) the diodes

Answer: A

- Explanation: A)  
 B)  
 C)  
 D)

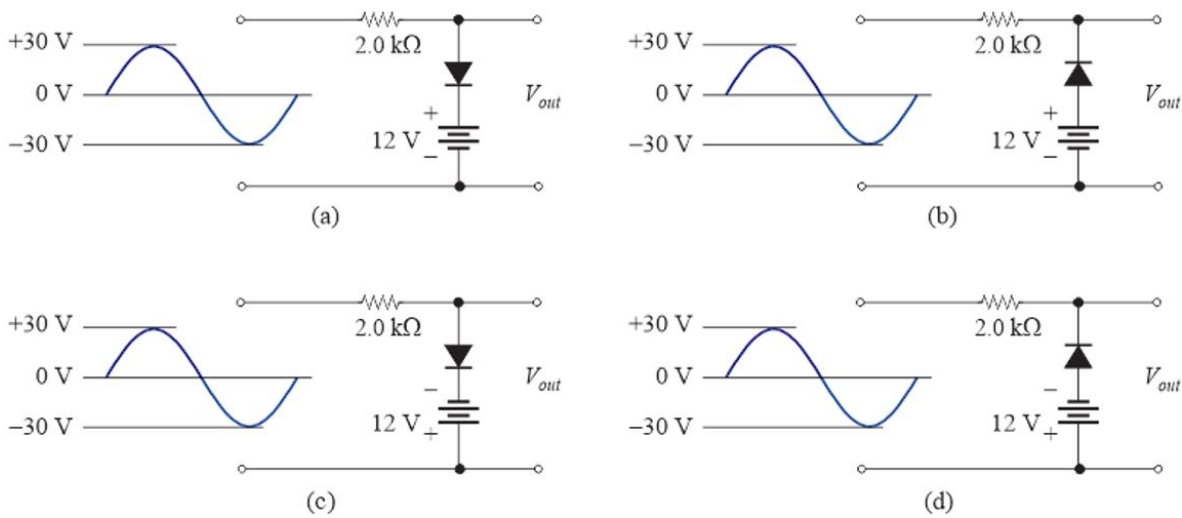


Figure 6

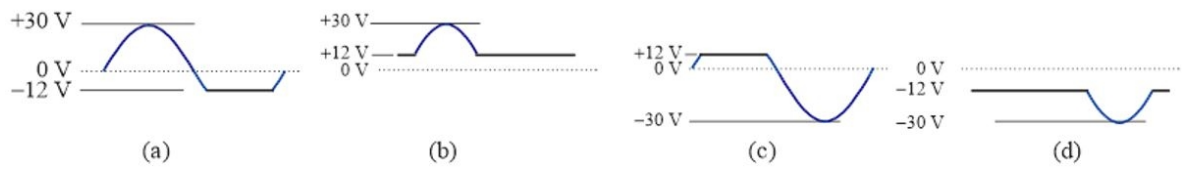


Figure 7

For questions 34, 35, and 36, assume ideal diodes

22) Which circuit in Figure 6 will produce the waveform in Figure 7(a)?

- A) (a)                      B) (b)                      C) (c)                      D) (d)

Answer: D

- Explanation: A)  
B)  
C)  
D)

22) \_\_\_\_\_

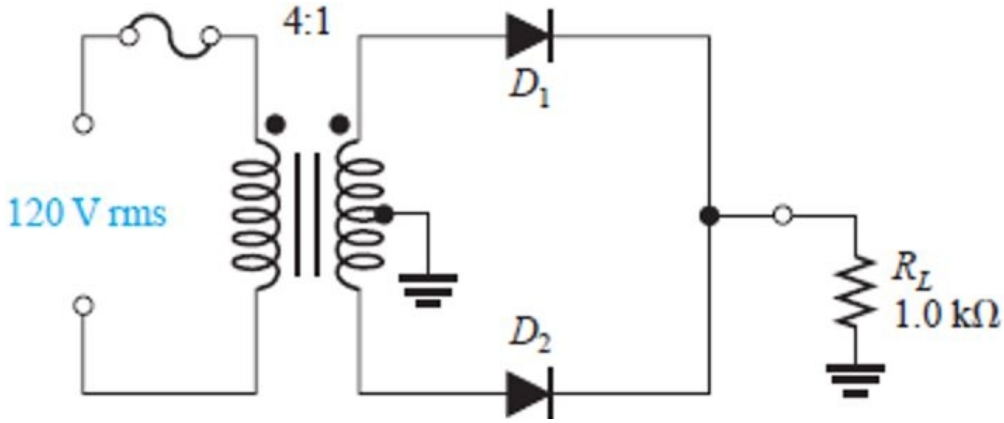


Figure 1

- 23) For the circuit in Figure 1, assume ideal diodes. The peak inverse voltage is approximately
- A) 42 V                      B) 21 V                      C) 36 V                      D) 0 V

23) \_\_\_\_\_

Answer: A

Explanation: A)  
B)  
C)  
D)

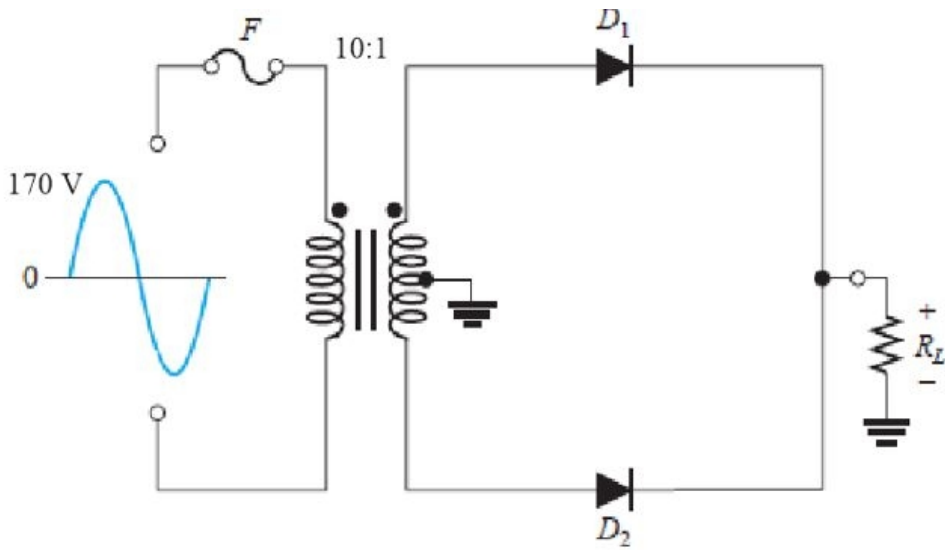


Figure 3

- 24) For the circuit in Figure 3, assume a diode opens. As a result, the peak output voltage will be
- A) larger                      B) zero  
C) approximately the same                      D) halved

24) \_\_\_\_\_

Answer: C

Explanation: A)  
B)  
C)  
D)

- 25) A silicon diode measures a very high value of resistance in one direction and very low resistance in the other. This indicates the diode is probably \_\_\_\_\_  
A) good                                      B) open                                      C) shorted

Answer: A  
Explanation: A)  
                  B)  
                  C)

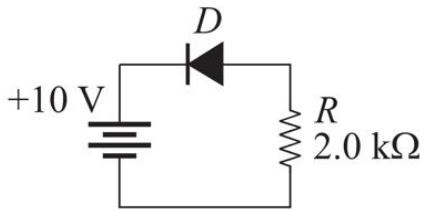


Figure 4

- 26) Refer to Figure 4. Assume the diode is a practical diode. The current in the diode will be \_\_\_\_\_  
A) 4.7 mA                                      B) 5.7 mA                                      C) 0 mA                                      D) 0.2 mA

Answer: C  
Explanation: A)  
                  B)  
                  C)  
                  D)

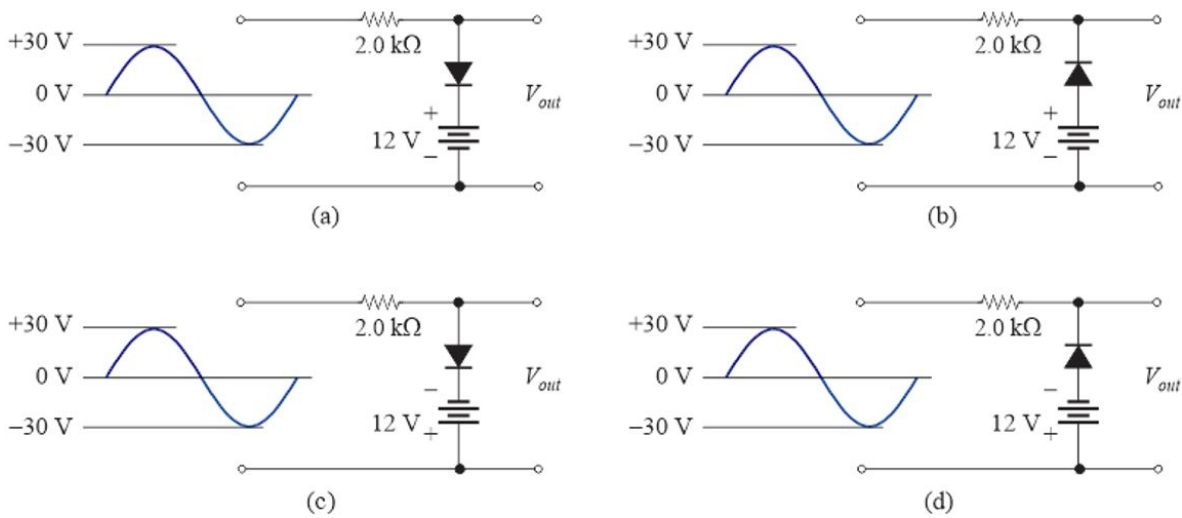


Figure 6

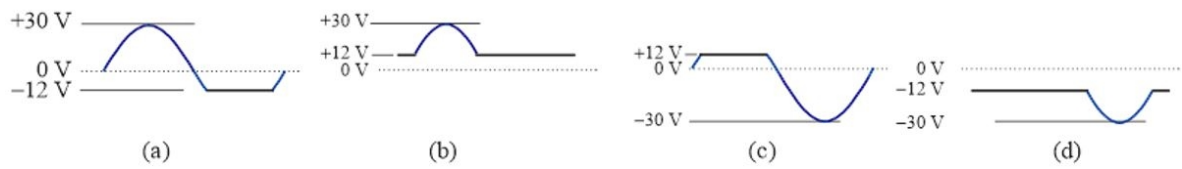


Figure 7

For questions 34, 35, and 36, assume ideal diodes

27) Which circuit in Figure 6 will produce the waveform in Figure 7(b)?

- A) (a)                      B) (b)                      C) (c)                      D) (d)

Answer: B

Explanation: A)  
B)  
C)  
D)

27) \_\_\_\_\_

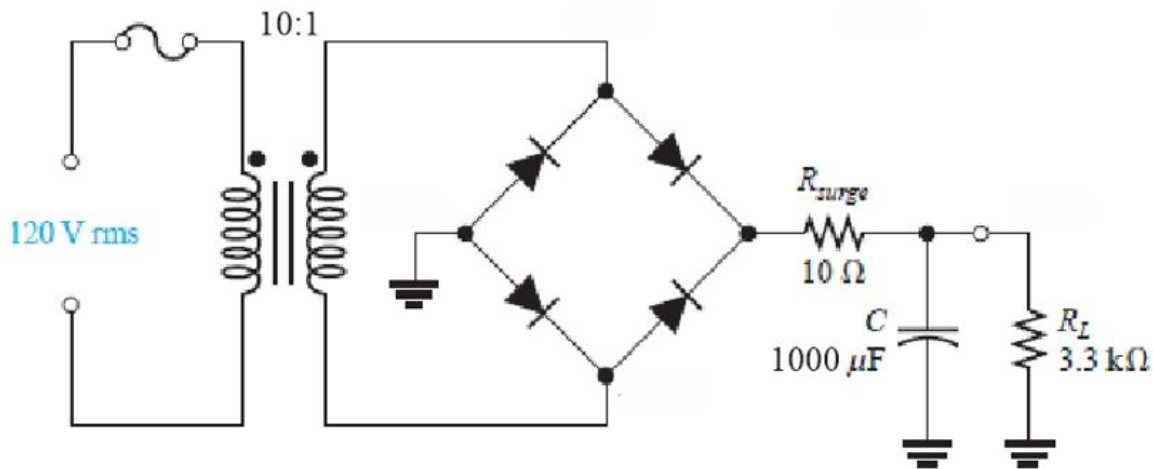


Figure 5

- 28) Refer to the circuit in Figure 5. The current in the load resistor is approximately  
 A) 10 mA                      B) 5 mA                      C) 15 mA                      D) 2.5 mA

28) \_\_\_\_\_

Answer: B

Explanation: A)  
 B)  
 C)  
 D)

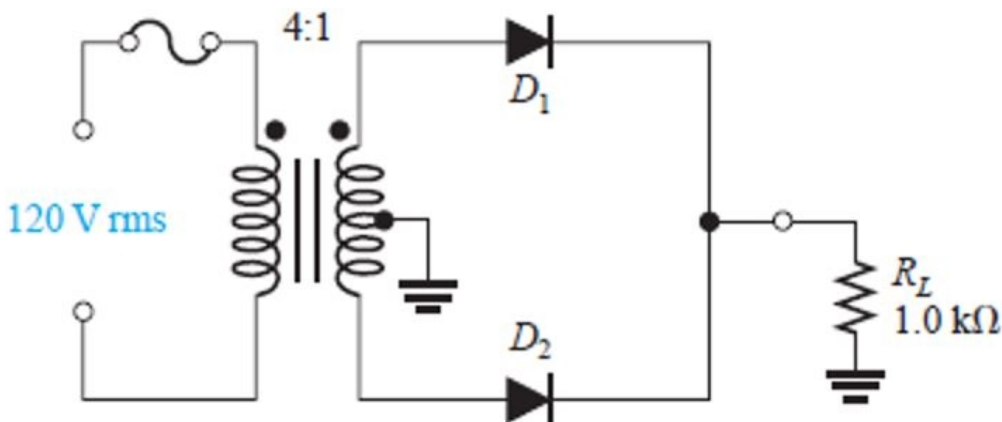


Figure 1

- 29) For the circuit in Figure 1, assume ideal diodes. The average voltage you should observe across  $R_L$  is

29) \_\_\_\_\_

- A) 13.5 V                      B) 19.2 V                      C) 9.6 V                      D) 27.0 V

Answer: A

Explanation: A)  
 B)  
 C)  
 D)

30) Assume an ideal diode has a series  $10\text{ k}\Omega$  resistor and is forward-biased with a  $20\text{ V}$  source. The current in the diode is

30) \_\_\_\_\_

A)  $2.0\text{ mA}$

B)  $0\text{ mA}$

C)  $1.0\text{ mA}$

D)  $0.5\text{ mA}$

Answer: A

Explanation: A)  
B)  
C)  
D)

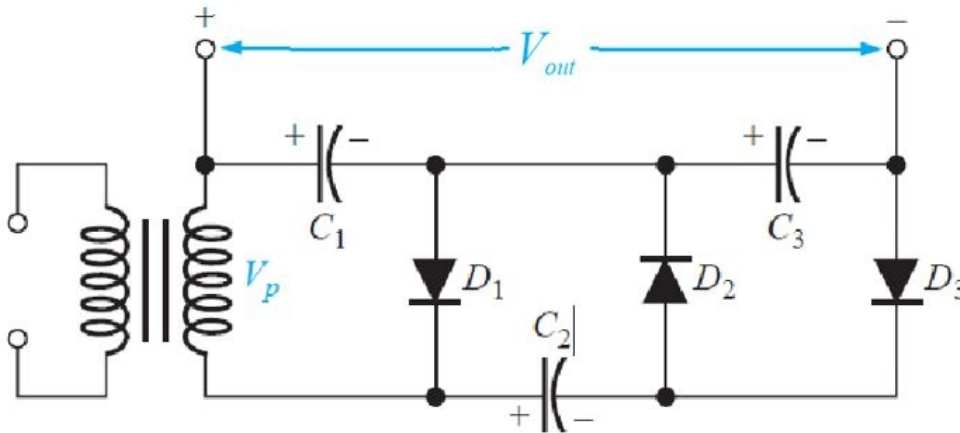


Figure 9

31) The circuit in Figure 9 is a

31) \_\_\_\_\_

A) clipping circuit

B) voltage doubler

C) voltage tripler

D) limiter circuit

Answer: C

Explanation: A)  
B)  
C)  
D)

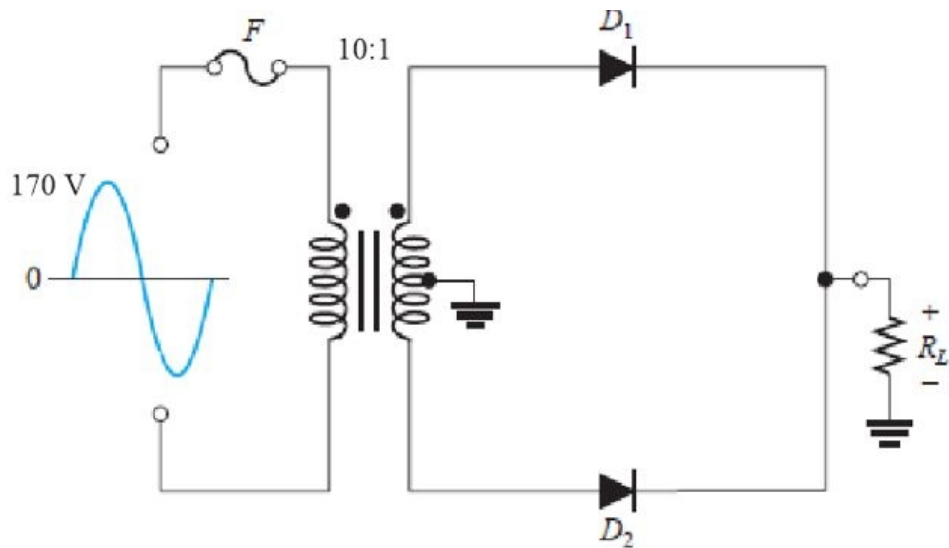


Figure 3

32) For the circuit in Figure 3, assume practical diodes. The peak output voltage across the load is

- A) 16.3 V      B) 17.7 V      C) 7.8 V      D) 9.2 V

32) \_\_\_\_\_

Answer: C

Explanation: A)  
B)  
C)  
D)



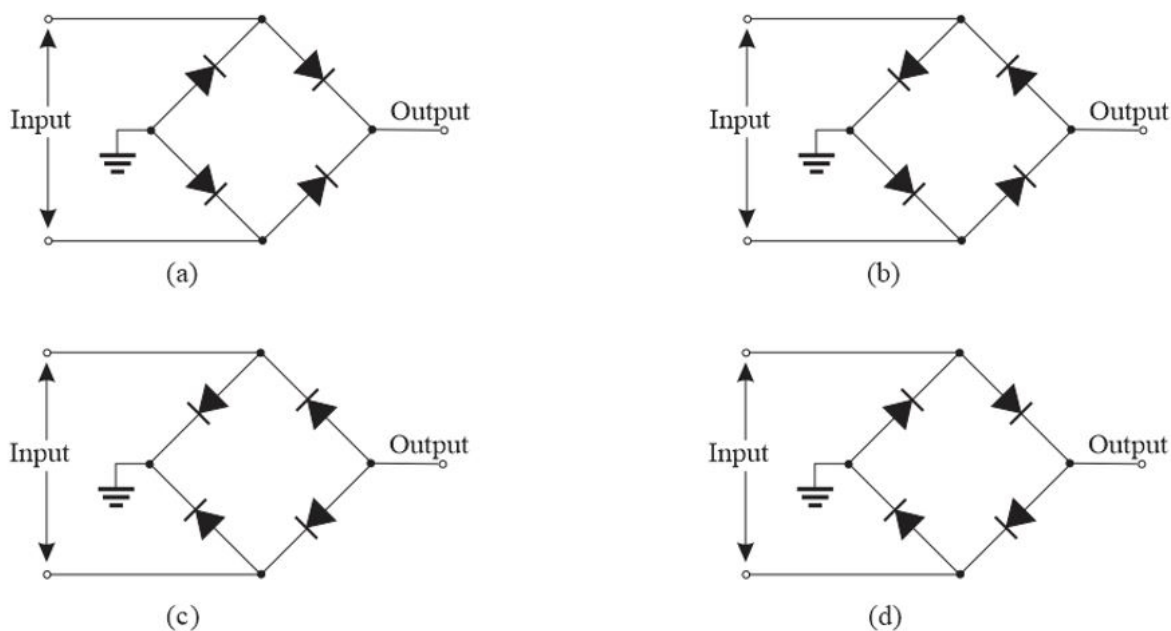


Figure 2

33) Refer to Figure 2. The circuit that will produce a negative output is 33) \_\_\_\_\_  
 A) (a)                      B) (b)                      C) (c)                      D) (d)

Answer: C  
 Explanation: A)  
 B)  
 C)  
 D)

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

34) The anode of a diode is usually marked by a band, a tab, or some other feature. 34) \_\_\_\_\_

Answer: True  False  
 Explanation:

35) For a forward-biased diode, as temperature increases, forward current also increases. 35) \_\_\_\_\_

Answer:  True      False  
 Explanation:

36) When a diode is forward-biased, the depletion region narrows. 36) \_\_\_\_\_

Answer:  True      False  
 Explanation:

37) To forward bias a diode, the *n*-region is connected to the positive side of a voltage source. 37) \_\_\_\_\_

Answer: True  False  
 Explanation:

38) Dynamic resistance is the same as linear resistance. 38) \_\_\_\_\_

Answer: True  False  
 Explanation:

39) When a diode is reverse-biased, the current is normally extremely small.

39) \_\_\_\_\_

Answer:  True  False

Explanation:

40) An *ideal* diode is considered to have a small forward voltage drop across the junction.

40) \_\_\_\_\_

Answer:  True  False

Explanation:

Answer Key

Testname: C2

- 1) C
- 2) B
- 3) A
- 4) D
- 5) A
- 6) C
- 7) C
- 8) B
- 9) A
- 10) D
- 11) A
- 12) C
- 13) C
- 14) D
- 15) A
- 16) D
- 17) B
- 18) C
- 19) B
- 20) B
- 21) A
- 22) D
- 23) A
- 24) C
- 25) A
- 26) C
- 27) B
- 28) B
- 29) A
- 30) A
- 31) C
- 32) C
- 33) C
- 34) FALSE
- 35) TRUE
- 36) TRUE
- 37) FALSE
- 38) FALSE
- 39) TRUE
- 40) FALSE