Exam

Name_____

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

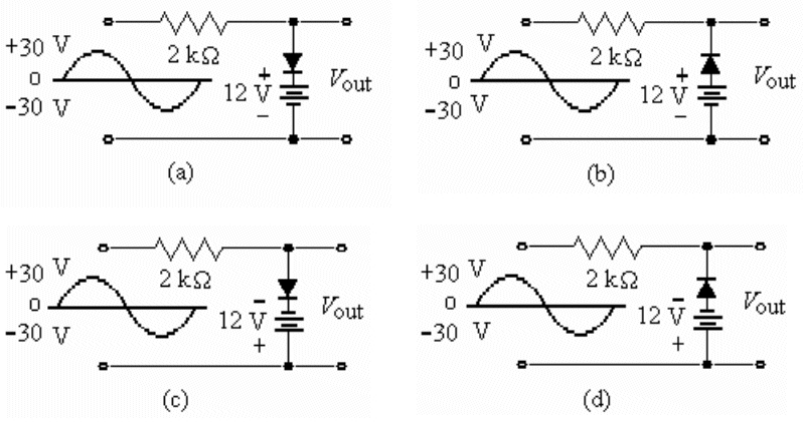


Figure I

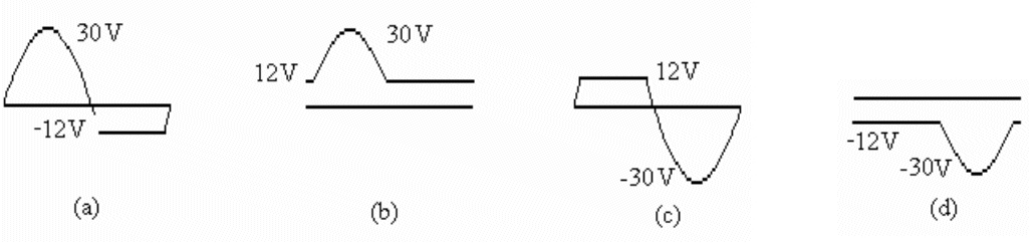
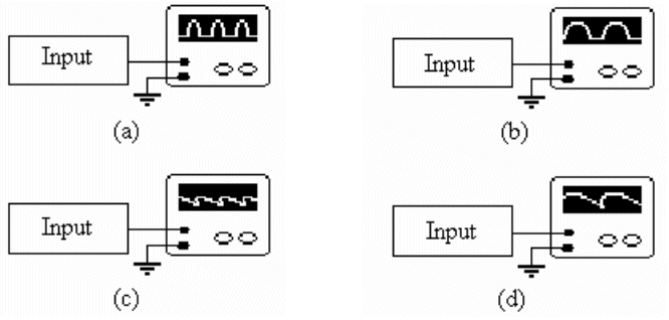


Figure II

1) Which of the circuits in Figure I will produce the signal in Figure II (c)? 1) _____
A) (a) B) (b) C) (c) D) (d)

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



2) Refer to the figure above. This is the output from 2) _____

A) a full-wave filtered rectifier with an open diode.
B) a half-wave rectifier with no filter.
C) a full-wave filtered rectifier.
D) a full-wave rectifier with no filter and an open diode.

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

3) The voltage regulation stage in a power supply 3) _____

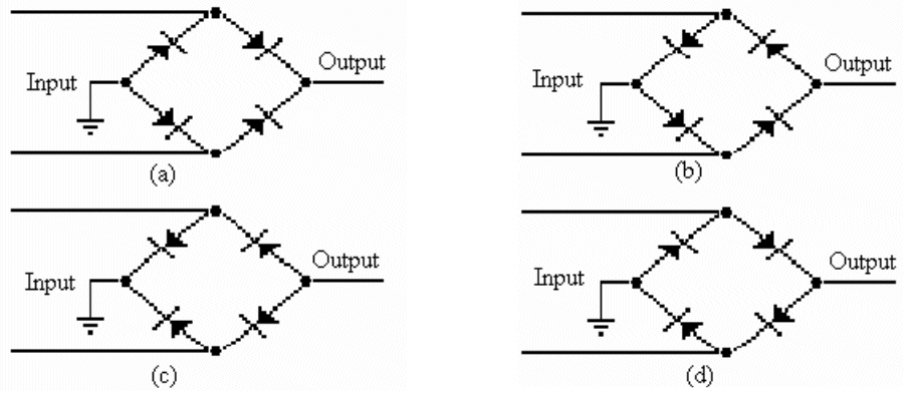
A) is inside the transformer.
B) is connected to the input of the rectifier(s).
C) follows the filter stage.
D) is located preceding the transformer primary.

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

4) The application of a dc voltage to control diode conduction is called 4) _____

A) bias. B) a pn junction. C) oscillation. D) amplification.

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



5) Refer to (c) in the figure above. This rectifier arrangement 5) _____

A) is incorrectly connected.
B) will produce a negative output voltage.
C) will produce a positive output voltage.
D) A or C above.

Answer: B

Explanation: A)
B)
C)
D)

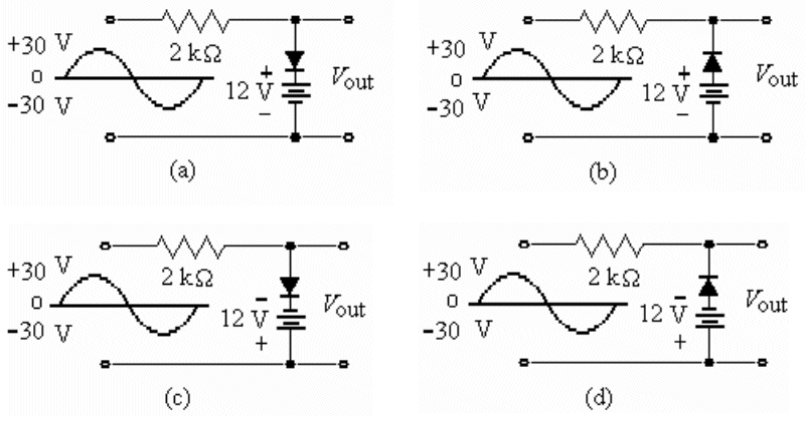


Figure I

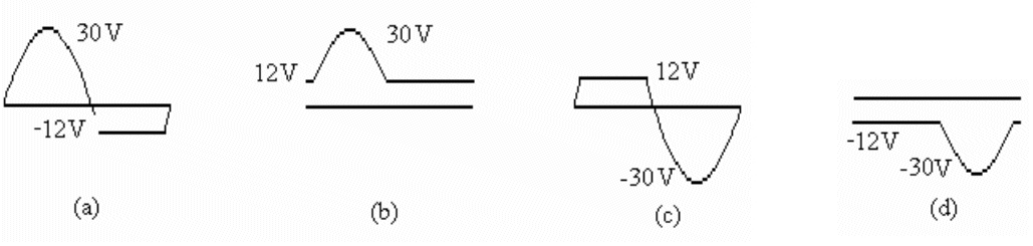


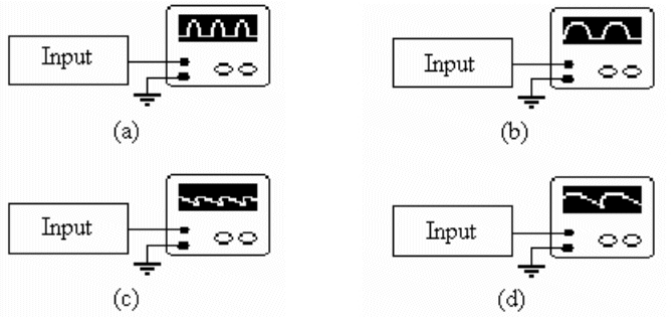
Figure II

6) Which of the circuits in Figure I will produce the signal in Figure II (a)? 6) _____

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

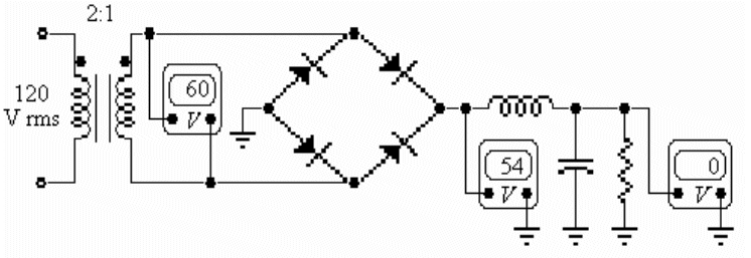
Answer: D

Explanation: A)
B)
C)
D)



7) Refer to the figure above. This trace shows the output from 7) _____
A) a full-wave rectifier with no filter and an open diode.
B) a half-wave rectifier with an open diode.
C) a half-wave rectifier with no filter.
D) a full-wave filtered rectifier with an open diode.

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



8) Refer to the figure above. If the voltmeter across the transformer secondary reads 0 V, the probable trouble is that 8) _____
A) the inductor is open.
B) one of the diodes is open.
C) the filter capacitor is open.
D) the transformer secondary is open.
E) No trouble exists; everything is normal.

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

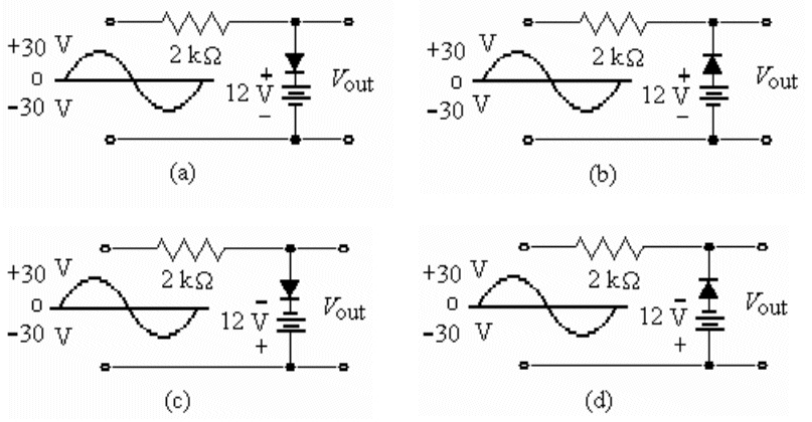


Figure I

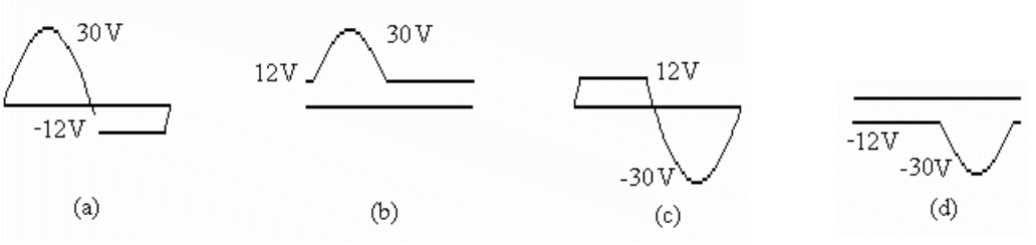


Figure II

9) Which of the circuits in Figure I will produce the signal in Figure II (b)? 9) _____

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

Answer: B

Explanation: A)
B)
C)
D)

10) A typical value of reverse breakdown voltage in a diode is 10) _____

A) 0.3 V. B) 50 V or larger. C) 0.7 V. D) 0 V.

Answer: B

Explanation: A)
B)
C)
D)

11) A silicon diode measures a high value of resistance with the meter leads in both positions. The trouble, if any, is 11) _____

A) the diode is internally shorted. B) nothing; the diode is good.

C) the diode is open. D) the diode is shorted to ground.

Answer: C

Explanation: A)
B)
C)
D)

12) The ripple frequency of a bridge rectifier is 12) _____

A) one-half the input frequency.
B) four times the input frequency.
C) the same as the input frequency.
D) double the input frequency.

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

13) The knee voltage of a diode is approximately equal to the 13) _____

A) applied voltage.
B) breakdown voltage.
C) reverse voltage.
D) barrier potential.

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

14) When a 60 Hz sinusoidal signal voltage is applied to the input of a half-wave rectifier, the output frequency is 14) _____

A) 30 Hz. B) 90 Hz. C) 120 Hz. D) 60 Hz.

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

15) To reduce surge current, _____ should be added to a power supply circuit. 15) _____

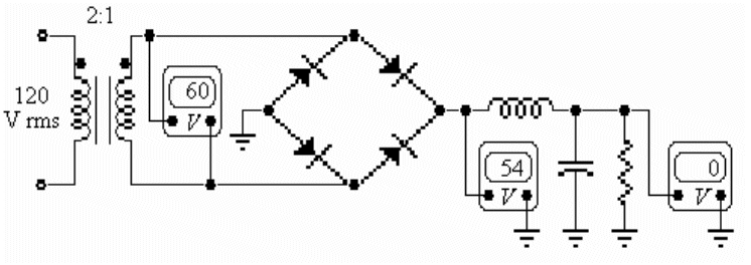
A) a surge-limiting resistor
B) a larger fuse
C) additional filter capacitance
D) a varactor tuning circuit

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

16) The diode in a half-wave rectifier conducts for _____ of the input cycle. 16) _____

A) 180° B) 90° C) 45° D) 0°

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



17) Refer to the figure above. In servicing this power supply, you notice that the ripple voltage is higher than normal and that the ripple frequency has changed to 60 Hz. The probable trouble is that 17) _____

A) a diode has shorted.
B) the inductor has opened.
C) a diode has opened.
D) the filter capacitor has opened.

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

18) With a half-wave rectified voltage across a load resistor, load current exists for what part of a cycle? 18) _____

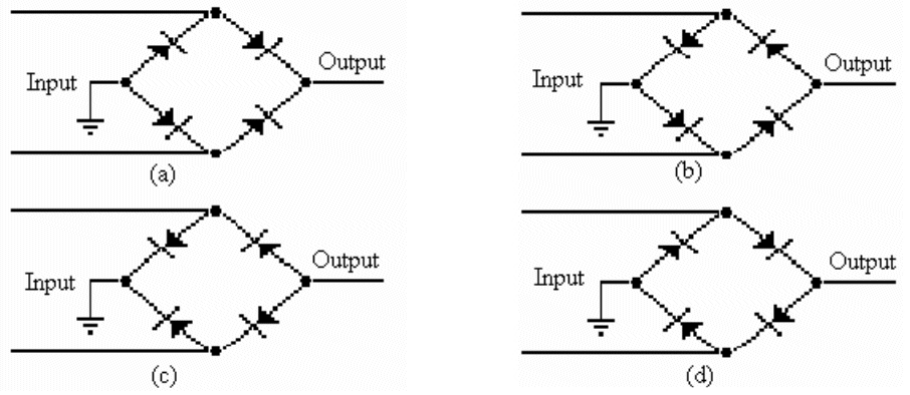
A) 180 degrees B) 0 degrees C) 90 degrees D) 360 degrees

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

19) A full-wave bridge rectifier uses _____ diode(s) in a bridge circuit. 19) _____

A) 3 B) 1 C) 2 D) 4

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



20) Refer to (d) in the figure above. This rectifier arrangement 20) _____

A) will produce a negative output voltage. B) will produce a positive output voltage.
C) is incorrectly connected. D) None of the above.

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

21) A reverse-biased silicon diode is connected in series with a 12 V source and a resistor. The voltage across the diode is 21) _____

A) 0.3 V. B) 12 V. C) 0 V. D) 0.7 V.

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

22) A silicon diode is connected in series with a 10 kΩ resistor and a 12 V battery. If the cathode of the diode is connected to the positive terminal of the battery, the voltage from the anode to the negative terminal of the battery is 22) _____

A) 12 V. B) 0 V. C) 11.3 V. D) 0.7 V.

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

23) On diode check, a shorted diode will measure 23) _____

A) 0.7 V. B) 0.3 V. C) 0.79 V. D) 0 V.

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

24) Voltage multipliers use _____ action to increase peak rectified voltages without increasing the input transformer voltage rating. 24) _____

A) clipping B) cropping C) charging D) clamping

Answer: D

Explanation: A)
B)
C)
D)

25) The forward voltage across a conducting silicon diode is about 25) _____

A) 0.7 V. B) -0.3 V. C) 1.3 V. D) 0.3 V.

Answer: A

Explanation: A)
B)
C)
D)

26) A silicon diode has a voltage to ground of 117 V from the anode. The voltage to ground from the cathode is 117.7 V. The diode is 26) _____

A) forward-biased. B) shorted.
C) conducting. D) reverse-biased.

Answer: D

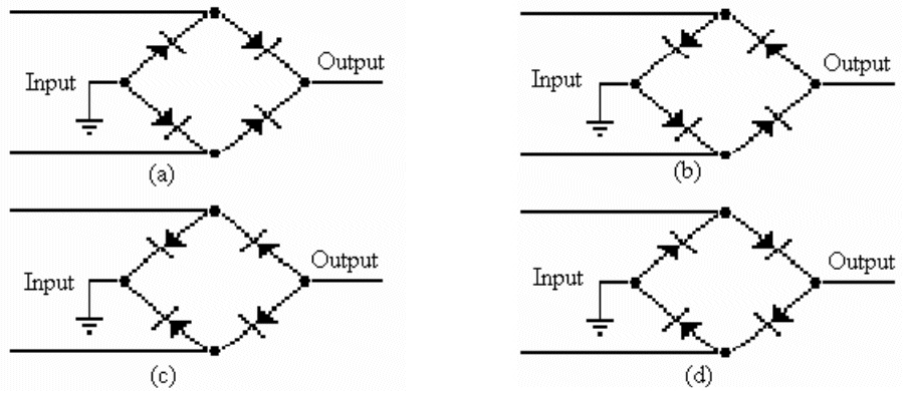
Explanation: A)
B)
C)
D)

27) The ideal dc output voltage of a capacitor-input filter equals the 27) _____

A) peak-to-peak value of the secondary voltage.
B) peak value of the rectified voltage.
C) average value of the rectified voltage.
D) rms value of the rectified voltage.

Answer: B

Explanation: A)
B)
C)
D)



28) Refer to the figure above. The correct diode arrangement to supply a positive output voltage is 28) _____
A) (a). B) (b). C) (c). D) (d).

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

29) Using a practical forward-biased diode, if the voltage at the anode were 10 V, the voltage at the cathode would equal 29) _____
A) 10.3 V. B) 9.3 V. C) 10 V. D) 10.7 V.

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

30) Reverse bias is a condition that essentially _____ current through the diode. 30) _____
A) amplifies B) prevents C) allows D) increases

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

31) A nonconducting diode is _____ biased. 31) _____
A) inverse B) poorly C) reverse D) forward

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

32) If input frequency is 60 Hz, the output frequency of a bridge rectifier is 32) _____
A) 120 Hz. B) 30 Hz. C) 60 Hz. D) 240 Hz.

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

33) A diode is operated in reverse bias. As the reverse voltage is decreased, the depletion region 33) _____
A) has a constant width. B) is not related to reverse voltage.
C) narrows. D) widens.

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

34) The small current when a diode is reverse-biased is called 34) _____
A) reverse-leakage current. B) conventional current.
C) reverse breakdown current. D) forward-bias current.

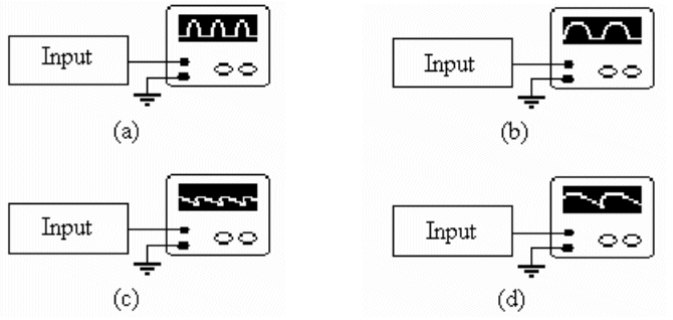
Answer: A
Explanation: A)
B)
C)
D)

35) All of the following diode information is provided by a manufacturer's data sheet except 35) _____
A) mechanical data. B) temperature parameters.
C) frequency response. D) PIV ratings.

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

36) A DMM measures 0.13 Ω in both directions when testing a diode. The diode is 36) _____
A) open. B) operating normally.
C) shorted. D) constructed of Si and is good.

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



37) Refer to the figure above. Which oscilloscope trace indicates the output from a filtered full-wave rectifier with an open diode? 37) _____

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

Answer: D

Explanation: A)
B)
C)
D)

38) How much forward diode voltage is there with the ideal-diode approximation? 38) _____

A) 1 V B) 0.7 V
C) More than 0.7 V D) 0 V

Answer: D

Explanation: A)
B)
C)
D)

39) A diode clamper will 39) _____

A) add an ac voltage to a signal.
B) eliminate the positive or negative alternation of a signal.
C) add a dc voltage to a signal.
D) clip off a portion of the input signal.

Answer: C

Explanation: A)
B)
C)
D)

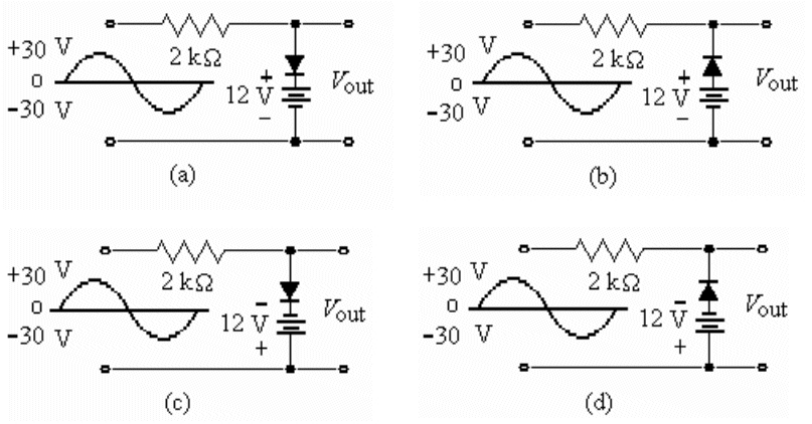


Figure I

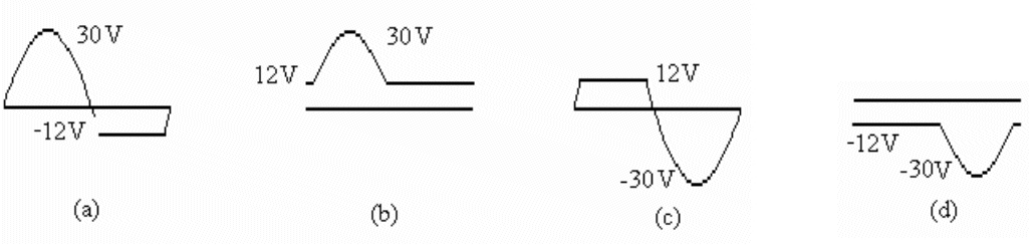


Figure II

40) Which of the circuits in Figure I will produce the signal in Figure II (d)? 40) _____

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

Answer: C

Explanation: A)
B)
C)
D)

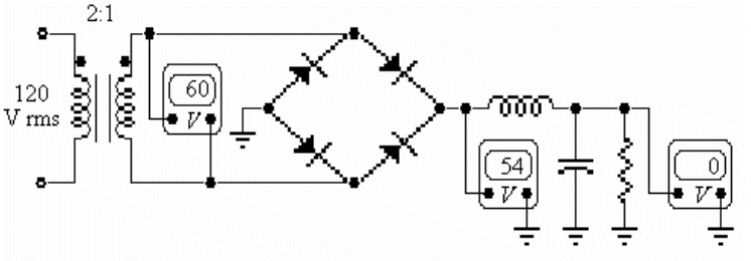
41) The resistance of a forward-biased diode is 41) _____

A) infinite. B) minimal below the knee of the curve.

C) minimal above the knee of the curve. D) perfectly linear.

Answer: C

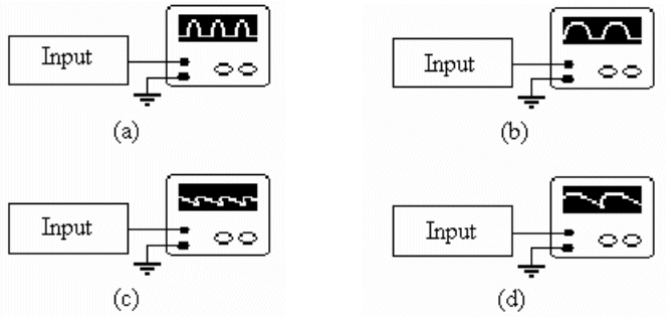
Explanation: A)
B)
C)
D)



42) Refer to the figure above. The probable trouble, if any, indicated by these voltages is 42) _____

A) one of the diodes is open.
B) an open transformer secondary.
C) an open transformer primary.
D) the inductor is open.
E) the filter capacitor is open.

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



43) Refer to the figure above. This oscilloscope trace indicates the output from 43) _____

A) a full-wave filtered rectifier with an open diode.
B) a full-wave rectifier with no filter and an open diode.
C) a full-wave filtered rectifier.
D) a half-wave filtered rectifier.

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

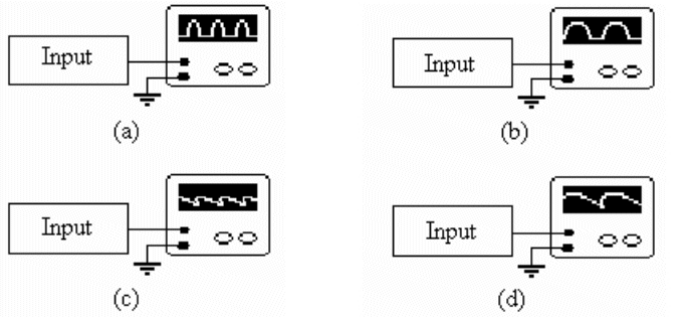
44) A reverse-biased diode has the _____ connected to the positive side of the source, and the _____ connected towards the negative side of the source. 44) _____

A) cathode, anode B) base, anode C) cathode, base D) anode, cathode

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

45) A typical value of reverse breakdown voltage in a diode is 45) _____
A) 0.7 V. B) 0.3 V. C) 0 V. D) 50 V or larger.

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



46) Refer to the figure above. The trace on this oscilloscope indicates the output from 46) _____
A) a full-wave filtered rectifier with an open diode.
B) a half-wave rectifier with no filter.
C) a full-wave filtered rectifier.
D) a full-wave rectifier with no filter.

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

47) As the load resistance in a filtered power supply varies, the output voltage 47) _____
A) remains constant. B) is unaffected.
C) does not change. D) varies.

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

48) A filtered full-wave rectifier voltage has a smaller ripple than does a half-wave rectifier voltage for the same load resistance and capacitor values because 48) _____
A) the larger the ripple, the better the filtering action.
B) of the longer time between peaks.
C) of the shorter time between peaks.
D) None of the above.

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

49) If the positive lead of an ohmmeter is placed on the cathode and the negative lead is placed on the anode, which of the following readings would indicate a defective diode? 49) _____

A) 1 MΩ B) 0 Ω C) ∞ Ω D) 400 kΩ

Answer: B

Explanation: A)
B)
C)
D)

50) The dc current through each diode in a bridge rectifier equals 50) _____

A) twice the dc load current. B) half the dc load current.
C) one-fourth the dc load current. D) the load current.

Answer: D

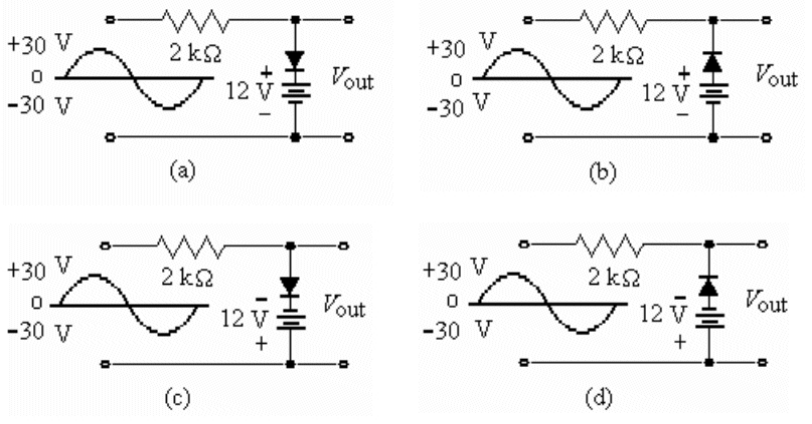
Explanation: A)
B)
C)
D)

51) A reverse-biased silicon diode is connected in series with a 12 V source and a resistor. The voltage across the resistor is 51) _____

A) 0.7 V. B) 0 V. C) 0.3 V. D) 12 V.

Answer: B

Explanation: A)
B)
C)
D)



52) Refer to the figure above. These circuits are known as 52) _____

A) clampers. B) amplifiers. C) clippers. D) rectifiers.

Answer: C

Explanation: A)
B)
C)
D)

53) Another name for a diode limiter is 53) _____

A) bridger. B) dc restorer. C) clamper. D) clipper.

Answer: D

Explanation: A)
B)
C)
D)

54) As the forward current through a forward-biased diode decreases, the voltage across the diode 54) _____

A) immediately drops to 0 V. B) increases.

C) increases and then decreases. D) is relatively constant.

Answer: D

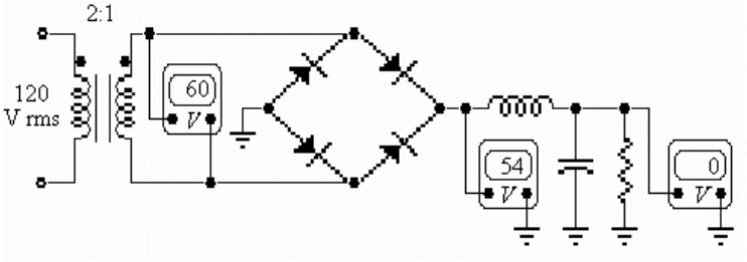
Explanation: A)
B)
C)
D)

55) The average value of the half-wave rectified output voltage is approximately _____ of Vp. 55) _____

A) 31.8% B) 70.7% C) 63.6% D) 100%

Answer: A

Explanation: A)
B)
C)
D)



56) Refer to the figure above. If the voltmeter across the transformer secondary reads 0 V, the probable trouble, if any, would be 56) _____

A) the inductor is shorted. B) the inductor is open.

C) one of the diodes is open. D) an open transformer primary.

Answer: D

Explanation: A)
B)
C)
D)

57) The peak inverse voltage across a nonconducting diode in an unfiltered bridge rectifier equals approximately 57) _____

A) the peak value of the secondary voltage.
B) half the peak secondary voltage.
C) four times the peak value of the secondary voltage.
D) twice the peak secondary voltage.

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

58) What must be used in series with a forward-biased diode to prevent damage due to excessive current? 58) _____

A) Nothing is required.
B) NC switch
C) Ammeter
D) Resistor

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

59) A voltage regulator compensates for changes in 59) _____

A) the input voltage.
B) the load conditions.
C) temperature.
D) All of the above.

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

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

60) A diode conducts current when forward-biased and blocks current when reverse-biased. 60) _____

Answer: True False
Explanation:

61) One of the advantages of using transformer coupling in a half-wave rectifier is that it allows the ac source to be directly connected to the load. 61) _____

Answer: True False
Explanation:

62) Reverse bias permits full current through a pn junction. 62) _____

Answer: True False
Explanation:

63) The PIV rating of a diode in a full-wave bridge rectifier is more than that required for a full-wave center-tapped configuration. 63) _____

Answer: True False
Explanation:

64) Clamping circuits use capacitors and diodes to add a dc level to a waveform. 64) _____

Answer: True False
Explanation:

65) The larger the ripple voltage, the better the filter. 65) _____

Answer: True False
Explanation:

Answer Key
Testname: C2

1) A
2) C
3) C
4) A
5) B
6) D
7) D
8) D
9) B
10) B
11) C
12) D
13) D
14) D
15) A
16) A
17) C
18) A
19) D
20) C
21) B
22) B
23) D
24) D
25) A
26) D
27) B
28) A
29) B
30) B
31) C
32) A
33) C
34) A
35) C
36) C
37) D
38) D
39) C
40) C
41) C
42) D
43) B
44) A
45) D
46) D
47) D
48) C
49) B
50) D

Answer Key
Testname: C2

51) B
52) C
53) D
54) D
55) A
56) D
57) A
58) D
59) D
60) TRUE
61) FALSE
62) FALSE
63) FALSE
64) TRUE
65) FALSE