

Study Guide for Exam Questions



This version of the Question Pool has been rearranged to follow the topics as presented in the ARRL General Class License Manual, 6th Edition. See the printed book for a version of the Question Pool arranged by Subelement, as released by the NCVEC Question Pool Committee.

As you study, cover the answer key provided at the margin to test your knowledge. (Please note: Answer selections may be presented in a different order on the actual FCC exam.)

Chapter 2, Section 2.1

BASIC OPERATING

What is the recommended way to break into a conversation when using phone?

- A. Say "QRZ" several times followed by your call sign
- B. Say your call sign during a break between transmissions from the other stations
- C. Say "Break" "Break" "Break" and wait for a response
- D. Say "CQ" followed by the call sign of either station

G2A12
(B)
Page 2-2

What does the expression "CQ DX" usually indicate?

- A. A general call for any station
- B. The caller is listening for a station in Germany
- C. The caller is looking for any station outside their own country
- D. This is a form of distress call

G2A13
(C)
Page 2-2

GOOD PRACTICES

What action should be taken if the frequency on which a net normally meets is in use just before the net begins?

- A. Reduce your output power and start the net as usual
- B. Increase your power output so that net participants will be able to hear you
- C. Ask the stations if the net may use the frequency, or move the net to a nearby clear frequency if necessary
- D. Cancel the net for that day

G2B01
(C)
Page 2-3

Chapter 4

Section 4.1

RESISTANCE AND OHM'S LAW

How many watts of electrical power are used if 400 VDC is supplied to an 800-ohm load?

- A. 0.5 watts
- B. 200 watts
- C. 400 watts
- D. 3200 watts

G5B03
(B)
Page 4-2

How many watts of electrical power are used by a 12-VDC light bulb that draws 0.2 amperes?

- A. 2.4 watts
- B. 24 watts
- C. 6 watts
- D. 60 watts

G5B04
(A)
Page 4-2

How many watts are being dissipated when a current of 7.0 milliamperes flows through 1.25 kilohms?

- A. Approximately 61 milliwatts
- B. Approximately 39 milliwatts
- C. Approximately 11 milliwatts
- D. Approximately 9 milliwatts

G5B05
(A)
Page 4-2

Section 4.2

DECIBELS

A two-times increase or decrease in power results in a change of how many dB?

- A. 2 dB
- B. 3 dB
- C. 6 dB
- D. 12 dB

G5B01
(B)
Page 4-4

What percentage of power loss would result from a transmission line loss of 1 dB?

- A. 10.9 %
- B. 12.2 %
- C. 20.5 %
- D. 25.9 %

G5B13
(C)
Page 4-5

RMS: DEFINITION AND MEASUREMENT

Which measurement of an AC signal is equivalent to a DC voltage of the same value?

- A. The peak-to-peak value
- B. The peak value
- C. The RMS value
- D. The reciprocal of the RMS value

G5B07
(C)
Page 4-5

G5B08
(D)
Page 4-6

What is the peak-to-peak voltage of a sine wave that has an RMS voltage of 120 volts?

- A. 84.8 volts
- B. 169.7 volts
- C. 240.0 volts
- D. 339.4 volts

G5B09
(B)
Page 4-6

What is the RMS voltage of sine wave with a value of 17 volts peak?

- A. 8.5 volts
- B. 12 volts
- C. 24 volts
- D. 34 volts

PEP: DEFINITION AND MEASUREMENT

G5B06
(B)
Page 4-7

What is the output PEP from a transmitter if an oscilloscope measures 200 volts peak-to-peak across a 50-ohm dummy load connected to the transmitter output?

- A. 1.4 watts
- B. 100 watts
- C. 353.5 watts
- D. 400 watts

G5B11
(B)
Page 4-7

What is the ratio of peak envelope power to average power for an unmodulated carrier?

- A. .707
- B. 1.00
- C. 1.414
- D. 2.00

G5B12
(B)
Page 4-7

What would be the voltage across a 50-ohm dummy load dissipating 1200 watts?

- A. 173 volts
- B. 245 volts
- C. 346 volts
- D. 692 volts

G5B14
(B)
Page 4-7

What is the output PEP from a transmitter if an oscilloscope measures 500 volts peak-to-peak across a 50-ohm resistor connected to the transmitter output?

- A. 8.75 watts
- B. 625 watts
- C. 2500 watts
- D. 5000 watts

G5B15
(B)
Page 4-7

What is the output PEP of an unmodulated carrier if an average reading wattmeter connected to the transmitter output indicates 1060 watts?

- A. 530 watts
- B. 1060 watts
- C. 1500 watts
- D. 2120 watts

Section 4.3

RESISTORS AND RESISTANCE

What will happen to the resistance if the temperature of a carbon resistor is increased?

- A. It will increase by 20% for every 10 degrees centigrade
- B. It will stay the same
- C. It will change depending on the resistor's temperature coefficient rating
- D. It will become time dependent

G6A01

(C)

Page 4-9

What is the main disadvantage of using a conventional wire-wound resistor in a resonant circuit?

- A. The resistor's tolerance value would not be adequate for such a circuit
- B. The resistor's inductance could detune the circuit
- C. The resistor could overheat
- D. The resistor's internal capacitance would detune the circuit

G6A06

(B)

Page 4-9

What type of component is a thermistor?

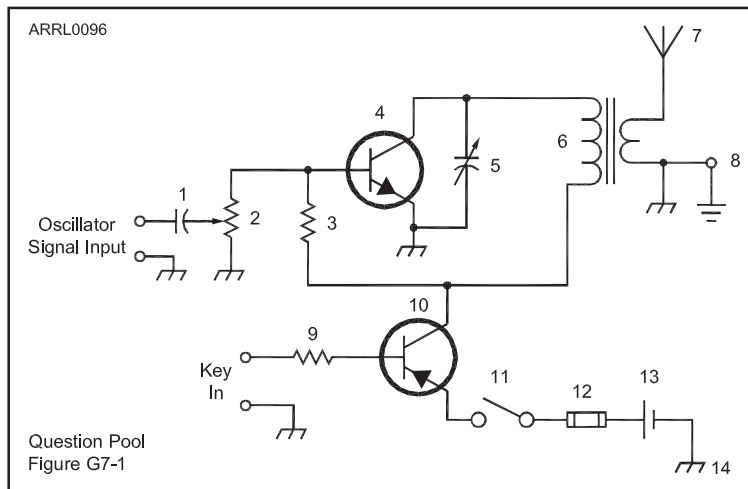
- A. A resistor that is resistant to changes in value with temperature variations
- B. A device having a controlled change in resistance with temperature variations
- C. A special type of transistor for use at very cold temperatures
- D. A capacitor that changes value with temperature

G6A13

(B)

Page 4-9

Figure G7-1 — Refer to this figure for questions G7A19 through G7A24.



Which symbol in figure G7-1 represents a fixed resistor?

- A. Symbol 2
- B. Symbol 6
- C. Symbol 3
- D. Symbol 12

G7A19

(C)

Page 4-10

INDUCTORS AND INDUCTANCE

- G6A07
(D)
Page 4-12
- What is an advantage of using a ferrite core with a toroidal inductor?
- A. Large values of inductance may be obtained
 - B. The magnetic properties of the core may be optimized for a specific range of frequencies
 - C. Most of the magnetic field is contained in the core
 - D. All of these choices are correct
- G6A08
(C)
Page 4-11
- How should two solenoid inductors be placed so as to minimize their mutual inductance?
- A. In line with their winding axis
 - B. With their winding axes parallel to each other
 - C. With their winding axes at right angles to each another
 - D. Within the same shielded enclosure
- G6A09
(B)
Page 4-11
- Why might it be important to minimize the mutual inductance between two inductors?
- A. To increase the energy transfer between both circuits
 - B. To reduce or eliminate unwanted coupling
 - C. To reduce conducted emissions
 - D. To increase the self-resonant frequency of both inductors
- G6A10
(B)
Page 4-11
- What is an effect of inter-turn capacitance in an inductor?
- A. The magnetic field may become inverted
 - B. The inductor may become self resonant at some frequencies
 - C. The permeability will increase
 - D. The voltage rating may be exceeded
- G6A12
(D)
Page 4-11
- What is the common name for an inductor used to help smooth the DC output from the rectifier in a conventional power supply?
- A. Back EMF choke
 - B. Repulsion coil
 - C. Charging inductor
 - D. Filter choke

CAPACITORS AND CAPACITANCE

- G6A02
(D)
Page 4-13
- What type of capacitor is often used in power-supply circuits to filter the rectified AC?
- A. Disc ceramic
 - B. Vacuum variable
 - C. Mica
 - D. Electrolytic
- G6A03
(D)
Page 4-13
- Which of the following is the primary advantage of ceramic capacitors?
- A. Tight tolerance
 - B. High stability
 - C. High capacitance for given volume
 - D. Comparatively low cost
- G6A04
(C)
Page 4-13
- Which of the following is an advantage of an electrolytic capacitor?
- A. Tight tolerance
 - B. Non-polarized
 - C. High capacitance for given volume
 - D. Inexpensive RF capacitor

Which of the following is one effect of lead inductance in a capacitor used at VHF and above?

- A. Effective capacitance may be reduced
- B. Voltage rating may be reduced
- C. ESR may be reduced
- D. The polarity of the capacitor might become reversed

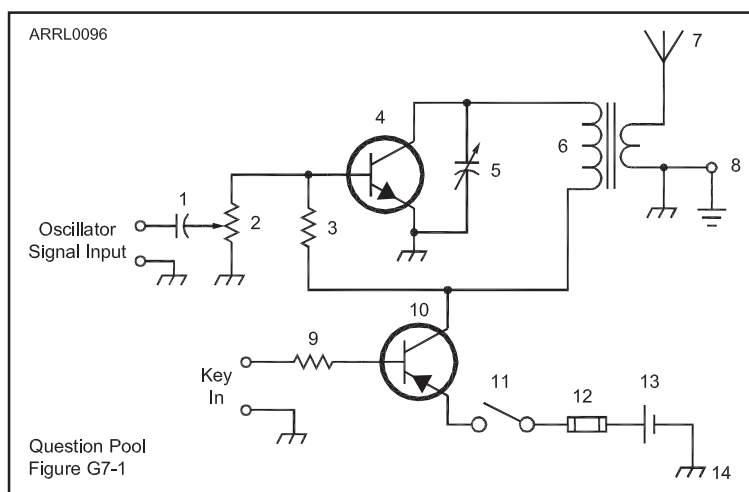
G6A05
(A)
Page 4-13

What is the common name for a capacitor connected across a transformer secondary that is used to absorb transient voltage spikes?

- A. Clipper capacitor
- B. Trimmer capacitor
- C. Feedback capacitor
- D. Suppressor capacitor

G6A11
(D)
Page 4-13

Figure G7-1 — Refer to this figure for questions G7A19 through G7A24.



Which symbol in figure G7-1 represents a variable capacitor?

- A. Symbol 2
- B. Symbol 11
- C. Symbol 5
- D. Symbol 12

G7A22
(C)
Page 4-12

SERIES AND PARALLEL CIRCUITS AND COMPONENTS

How does the total current relate to the individual currents in each branch of a parallel circuit?

- A. It equals the average of each branch current
- B. It decreases as more parallel branches are added to the circuit
- C. It equals the sum of the currents through each branch
- D. It is the sum of the reciprocal of each individual voltage drop

G5B02
(C)
Page 4-14

What is the total resistance of three 100-ohm resistors in parallel?

- A. .30 ohms
- B. .33 ohms
- C. 33.3 ohms
- D. 300 ohms

G5C04
(C)
Page 4-15

G5C05 (C) Page 4-15	<p>What is the value of each resistor if three equal value resistors in parallel produce 50 ohms of resistance, and the same three resistors in series produce 450 ohms?</p> <p>A. 1500 ohms B. 90 ohms C. 150 ohms D. 175 ohms</p>
G5C08 (D) Page 4-15	<p>What is the equivalent capacitance of two 5000 picofarad capacitors and one 750 picofarad capacitor connected in parallel?</p> <p>A. 576.9 picofarads B. 1733 picofarads C. 3583 picofarads D. 10750 picofarads</p>
G5C09 (C) Page 4-15	<p>What is the capacitance of three 100 microfarad capacitors connected in series?</p> <p>A. .30 microfarads B. .33 microfarads C. 33.3 microfarads D. 300 microfarads</p>
G5C10 (C) Page 4-15	<p>What is the inductance of three 10 millihenry inductors connected in parallel?</p> <p>A. .30 Henrys B. 3.3 Henrys C. 3.3 millihenrys D. 30 millihenrys</p>
G5C11 (C) Page 4-15	<p>What is the inductance of a 20 millihenry inductor in series with a 50 millihenry inductor?</p> <p>A. .07 millihenrys B. 14.3 millihenrys C. 70 millihenrys D. 1000 millihenrys</p>
G5C12 (B) Page 4-15	<p>What is the capacitance of a 20 microfarad capacitor in series with a 50 microfarad capacitor?</p> <p>A. .07 microfarads B. 14.3 microfarads C. 70 microfarads D. 1000 microfarads</p>
G5C13 (C) Page 4-14	<p>What component should be added to a capacitor in a circuit to increase the circuit capacitance?</p> <p>A. An inductor in series B. A resistor in series C. A capacitor in parallel D. A capacitor in series</p>
G5C14 (D) Page 4-14	<p>What component should be added to an inductor in a circuit to increase the circuit inductance?</p> <p>A. A capacitor in series B. A resistor in parallel C. An inductor in parallel D. An inductor in series</p>

What is the total resistance of a 10 ohm, a 20 ohm, and a 50 ohm resistor in parallel?

- A. 5.9 ohms
- B. 0.17 ohms
- C. 10000 ohms
- D. 80 ohms

G5C15

(A)

Page 4-15

What component should be added to an existing resistor in a circuit to increase circuit resistance?

- A. A resistor in parallel
- B. A resistor in series
- C. A capacitor in series
- D. A capacitor in parallel

G5C16

(B)

Page 4-14

TRANSFORMERS

What causes a voltage to appear across the secondary winding of a transformer when an AC voltage source is connected across its primary winding?

- A. Capacitive coupling
- B. Displacement current coupling
- C. Mutual inductance
- D. Mutual capacitance

G5C01

(C)

Page 4-16

Where is the source of energy normally connected in a transformer?

- A. To the secondary winding
- B. To the primary winding
- C. To the core
- D. To the plates

G5C02

(B)

Page 4-16

What is current in the primary winding of a transformer called if no load is attached to the secondary?

- A. Magnetizing current
- B. Direct current
- C. Excitation current
- D. Stabilizing current

G5C03

(A)

Page 4-17

What is the voltage across a 500-turn secondary winding in a transformer if the 2250-turn primary is connected to 120 VAC?

- A. 2370 volts
- B. 540 volts
- C. 26.7 volts
- D. 5.9 volts

G5C06

(C)

Page 4-16

What is the turns ratio of a transformer used to match an audio amplifier having a 600-ohm output impedance to a speaker having a 4-ohm impedance?

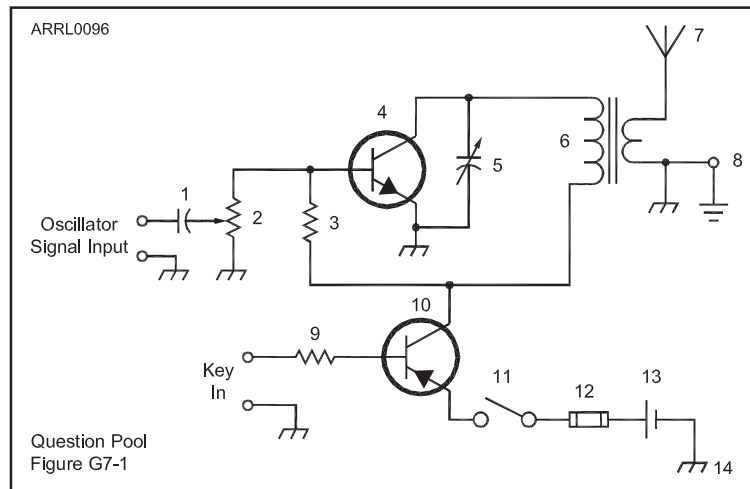
- A. 12.2 to 1
- B. 24.4 to 1
- C. 150 to 1
- D. 300 to 1

G5C07

(A)

Page 4-16

Figure G7-1 — Refer to this figure for questions G7A19 through G7A24.



G7A23
(A)
Page 4-16

Which symbol in figure G7-1 represents a transformer?

- A. Symbol 6
- B. Symbol 4
- C. Symbol 10
- D. Symbol 2

VACUUM TUBES

G6B10
(A)
Page 4-17

Which element of a triode vacuum tube is used to regulate the flow of electrons between cathode and plate?

- A. Control grid
- B. Heater
- C. Screen Grid
- D. Suppressor grid

G6B11
(B)
Page 4-18

Which of the following solid state devices is most like a vacuum tube in its general characteristics?

- A. A bipolar transistor
- B. An FET
- C. A tunnel diode
- D. A varistor

G6B12
(A)
Page 4-17

What is the primary purpose of a screen grid in a vacuum tube?

- A. To reduce grid-to-plate capacitance
- B. To increase efficiency
- C. To increase the high frequency response
- D. To decrease plate resistance

Section 4.4

REACTANCE

What is reactance?

- A. Opposition to the flow of direct current caused by resistance
- B. Opposition to the flow of alternating current caused by capacitance or inductance
- C. A property of ideal resistors in AC circuits
- D. A large spark produced at switch contacts when an inductor is deenergized

G5A02
(B)
Page 4-18

Which of the following causes opposition to the flow of alternating current in an inductor?

- A. Conductance
- B. Reluctance
- C. Admittance
- D. Reactance

G5A03
(D)
Page 4-20

Which of the following causes opposition to the flow of alternating current in a capacitor?

- A. Conductance
- B. Reluctance
- C. Reactance
- D. Admittance

G5A04
(C)
Page 4-19

How does a coil react to AC?

- A. As the frequency of the applied AC increases, the reactance decreases
- B. As the amplitude of the applied AC increases, the reactance increases
- C. As the amplitude of the applied AC increases, the reactance decreases
- D. As the frequency of the applied AC increases, the reactance increases

G5A05
(D)
Page 4-20

How does a capacitor react to AC?

- A. As the frequency of the applied AC increases, the reactance decreases
- B. As the frequency of the applied AC increases, the reactance increases
- C. As the amplitude of the applied AC increases, the reactance increases
- D. As the amplitude of the applied AC increases, the reactance decreases

G5A06
(A)
Page 4-19

What unit is used to measure reactance?

- A. Farad
- B. Ohm
- C. Ampere
- D. Siemens

G5A09
(B)
Page 4-18

IMPEDANCE

What is impedance?

- A. The electric charge stored by a capacitor
- B. The inverse of resistance
- C. The opposition to the flow of current in an AC circuit
- D. The force of repulsion between two similar electric fields

G5A01
(C)
Page 4-20

What unit is used to measure impedance?

- A. Volt
- B. Ohm
- C. Ampere
- D. Watt

G5A10
(B)
Page 4-20

RESONANCE, SOURCE AND LOAD IMPEDANCE MATCHING

- G5A07
(D)
Page 4-21
- What happens when the impedance of an electrical load is equal to the internal impedance of the power source?
- A. The source delivers minimum power to the load
 - B. The electrical load is shorted
 - C. No current can flow through the circuit
 - D. The source can deliver maximum power to the load
- G5A08
(A)
Page 4-21
- Why is impedance matching important?
- A. So the source can deliver maximum power to the load
 - B. So the load will draw minimum power from the source
 - C. To ensure that there is less resistance than reactance in the circuit
 - D. To ensure that the resistance and reactance in the circuit are equal
- G5A11
(A)
Page 4-22
- Why should core saturation of a conventional impedance matching transformer be avoided?
- A. Harmonics and distortion could result
 - B. Magnetic flux would increase with frequency
 - C. RF susceptance would increase
 - D. Temporary changes of the core permeability could result
- G5A12
(B)
Page 4-21
- What is one reason to use an impedance matching transformer?
- A. To reduce power dissipation in the transmitter
 - B. To maximize the transfer of power
 - C. To minimize SWR at the antenna
 - D. To minimize SWR in the transmission line
- G5A13
(D)
Page 4-21
- Which of the following devices can be used for impedance matching at radio frequencies?
- A. A transformer
 - B. A Pi-network
 - C. A length of transmission line
 - D. All of these choices are correct
- G5A14
(A)
Page 4-21
- Which of the following describes one method of impedance matching between two AC circuits?
- A. Insert an LC network between the two circuits
 - B. Reduce the power output of the first circuit
 - C. Increase the power output of the first circuit
 - D. Insert a circulator between the two circuits

Section 4.5

DIODES AND RECTIFIERS

- G6B01
(C)
Page 4-22
- What is the peak-inverse-voltage rating of a rectifier?
- A. The maximum voltage the rectifier will handle in the conducting direction
 - B. 1.4 times the AC frequency
 - C. The maximum voltage the rectifier will handle in the non-conducting direction
 - D. 2.8 times the AC frequency
- G6B02
(A)
Page 4-22
- What are the two major ratings that must not be exceeded for silicon-diode rectifiers?
- A. Peak inverse voltage; average forward current
 - B. Average power; average voltage
 - C. Capacitive reactance; avalanche voltage
 - D. Peak load impedance; peak voltage

What is the approximate junction threshold voltage of a germanium diode?

- A. 0.1 volt
- B. 0.3 volts
- C. 0.7 volts
- D. 1.0 volts

G6B03

(B)

Page 4-22

What is the approximate junction threshold voltage of a silicon diode?

- A. 0.1 volt
- B. 0.3 volts
- C. 0.7 volts
- D. 1.0 volts

G6B05

(C)

Page 4-22

Which of the following is an advantage of using a Schottky diode in an RF switching circuit as compared to a standard silicon diode?

- A. Lower capacitance
- B. Lower inductance
- C. Longer switching times
- D. Higher breakdown voltage

G6B06

(A)

Page 4-23

BIPOLAR AND FET TRANSISTORS

What are the stable operating points for a bipolar transistor that is used as a switch in a logic circuit?

- A. Its saturation and cut-off regions
- B. Its active region (between the cut-off and saturation regions)
- C. Between its peak and valley current points
- D. Between its enhancement and depletion modes

G6B07

(A)

Page 4-24

Why is it often necessary to insulate the case of a large power transistor?

- A. To increase the beta of the transistor
- B. To improve the power dissipation capability
- C. To reduce stray capacitance
- D. To avoid shorting the collector or drain voltage to ground

G6B08

(D)

Page 4-25

Which of the following describes the construction of a MOSFET?

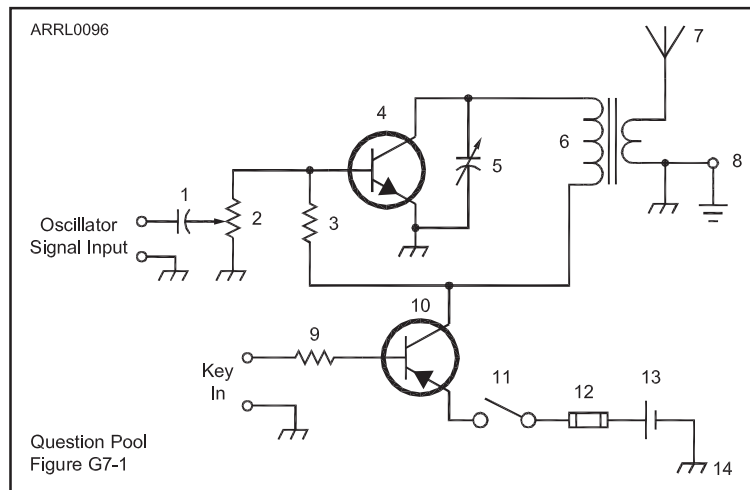
- A. The gate is formed by a back-biased junction
- B. The gate is separated from the channel with a thin insulating layer
- C. The source is separated from the drain by a thin insulating layer
- D. The source is formed by depositing metal on silicon

G6B09

(B)

Page 4-24

Figure G7-1 — Refer to this figure for questions G7A19 through G7A24.



G7A21
(B)
Page 4-23

Which symbol in figure G7-1 represents a single a NPN transistor?

A. Symbol 2
B. Symbol 4
C. Symbol 10
D. Symbol 12

G6C01
(D)
Page 4-25

Which of the following is most often provided as an analog integrated circuit?

A. NAND Gate
B. Gallium Arsenide UHF Receiver “front end” Amplifier
C. Frequency Counter
D. Linear voltage regulator

G6C02
(C)
Page 4-27

Which of the following is the most commonly used digital logic family of integrated circuits?

A. RTL
B. TTL
C. CMOS
D. PMOS

G6C03
(A)
Page 4-27

Which of the following is an advantage of CMOS Logic integrated circuits compared to TTL logic circuits?

A. Low power consumption
B. High power handling capability
C. Better suited for RF amplification
D. Better suited for power supply regulation

G6C06
(D)
Page 4-25

Which type of integrated circuit is an operational amplifier?

A. Digital
B. MMIC
C. Programmable
D. Analog

Which of the following describes a “flip-flop” circuit?

- A. A transmit-receive circuit
- B. A digital circuit with two stable states
- C. An RF limiter
- D. A voice-operated switch

G7B01

(B)

Page 4-25

Why do digital circuits use the binary number system?

- A. Binary “ones” and “zeros” are easy to represent with an “on” or “off” state
- B. The binary number system is most accurate
- C. Binary numbers are more compatible with analog circuitry
- D. All of these answers are correct

G7B02

(A)

Page 4-25

What is the output of a two-input NAND gate, given both inputs are “one”?

- A. Two
- B. One
- C. Zero
- D. Minus One

G7B03

(C)

Page 4-25

What is the output of a NOR gate given that both inputs are “zero”?

- A. Zero
- B. One
- C. Minus one
- D. The opposite from the previous state

G7B04

(B)

Page 4-25

How many states are there in a 3-bit binary counter?

- A. 3
- B. 6
- C. 8
- D. 16

G7B05

(C)

Page 4-27

What is a shift register?

- A. A clocked array of circuits that passes data in steps along the array
- B. An array of operational amplifiers used for tri-state arithmetic operations
- C. A digital mixer
- D. An analog mixer

G7B06

(A)

Page 4-27

RF INTEGRATED CIRCUITS

What is meant by the term MMIC?

- A. Multi Megabyte Integrated Circuit
- B. Monolithic Microwave Integrated Circuit
- C. Military-specification Manufactured Integrated Circuit
- D. Mode Modulated Integrated Circuit

G6C10

(B)

Page 4-27

MICROPROCESSORS AND RELATED COMPONENTS

What is meant by the term ROM?

- A. Resistor Operated Memory
- B. Read Only Memory
- C. Random Operational Memory
- D. Resistant to Overload Memory

G6C04

(B)

Page 4-28

G6C05
(C)
Page 4-28

- What is meant when memory is characterized as “non-volatile”?
- A. It is resistant to radiation damage
 - B. It is resistant to high temperatures
 - C. The stored information is maintained even if power is removed
 - D. The stored information cannot be changed once written

G6C11
(B)
Page 4-28

- What is a microprocessor?
- A. A low powered analog signal processor used as a microwave detector
 - B. A miniature computer on a single integrated circuit chip
 - C. A microwave detector, amplifier, and local oscillator on a chip
 - D. A low voltage amplifier used in a microwave transmitter modulator stage

G6C12
(A)
Page 4-29

- What two devices in an amateur radio station might be connected using a USB interface?
- A. Computer and transceiver
 - B. Microphone and transceiver
 - C. Amplifier and antenna
 - D. Power supply and amplifier

VISUAL INTERFACES

G6C07
(D)
Page 4-29

- What is one disadvantage of an incandescent indicator compared to a LED?
- A. Low power consumption
 - B. High speed
 - C. Long life
 - D. High power consumption

G6C08
(D)
Page 4-29

- How is an LED biased when emitting light?
- A. Beyond cutoff
 - B. At the Zener voltage
 - C. Reverse Biased
 - D. Forward Biased

G6C09
(A)
Page 4-29

- Which of the following is a characteristic of a liquid crystal display?
- A. It requires ambient or back lighting
 - B. It offers a wide dynamic range
 - C. It has a wide viewing angle
 - D. All of these choices are correct

Section 4.6

RECTIFIERS AND POWER SUPPLIES

G6B04
(C)
Page 4-32

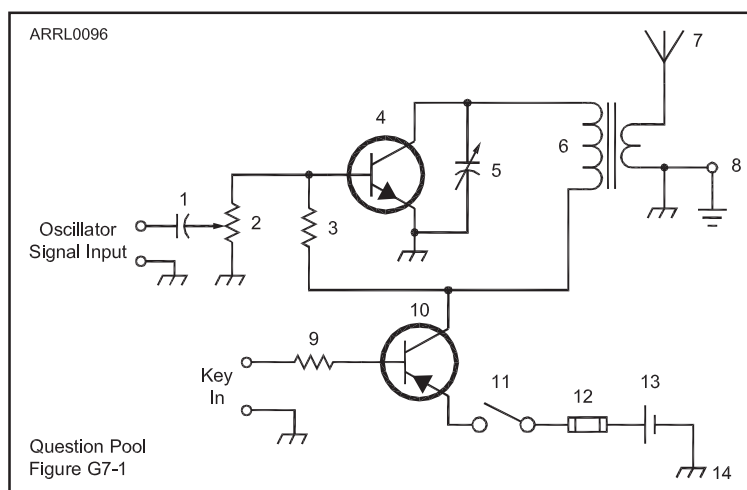
- When two or more diodes are connected in parallel to increase current handling capacity, what is the purpose of the resistor connected in series with each diode?
- A. The resistors ensure the thermal stability of the power supply
 - B. The resistors regulate the power supply output voltage
 - C. The resistors ensure that one diode doesn't carry most of the current
 - D. The resistors act as swamping resistors in the circuit

G7A01
(B)
Page 4-33

- What safety feature does a power-supply bleeder resistor provide?
- A. It acts as a fuse for excess voltage
 - B. It discharges the filter capacitors
 - C. It removes shock hazards from the induction coils
 - D. It eliminates ground-loop current

What components are used in a power-supply filter network?	G7A02
A. Diodes	(D)
B. Transformers and transistors	Page 4-32
C. Quartz crystals	
D. Capacitors and inductors	
What should be the minimum peak-inverse-voltage rating of the rectifier in a full-wave power supply?	G7A03
A. One-quarter the normal output voltage of the power supply	(C)
B. Half the normal output voltage of the power supply	Page 4-31
C. Double the normal peak output voltage of the power supply	
D. Equal to the normal output voltage of the power supply	
What should be the approximate minimum peak-inverse-voltage rating of the rectifier in a half-wave power supply?	G7A04
A. One-half the normal peak output voltage of the power supply	(D)
B. Half the normal output voltage of the power supply	Page 4-31
C. Equal to the normal output voltage of the power supply	
D. Two times the normal peak output voltage of the power supply	
Which of the following is a desirable characteristic for capacitors used to filter the DC output of a switching power supply?	G7A14
A. Low equivalent series resistance	(A)
B. High equivalent series resistance	Page 4-34
C. Low Temperature coefficient	
D. High Temperature coefficient	
Which of the following is an advantage of a switched-mode power supply as compared to a linear power supply?	G7A15
A. Faster switching time makes higher output voltage possible	(C)
B. Fewer circuit components are required	Page 4-34
C. High frequency operation allows the use of smaller components	
D. All of these choices are correct	
What portion of the AC cycle is converted to DC by a half-wave rectifier?	G7A16
A. 90 degrees	(B)
B. 180 degrees	Page 4-30
C. 270 degrees	
D. 360 degrees	
What portion of the AC cycle is converted to DC by a full-wave rectifier?	G7A17
A. 90 degrees	(D)
B. 180 degrees	Page 4-30
C. 270 degrees	
D. 360 degrees	
What is the output waveform of an unfiltered full-wave rectifier connected to a resistive load?	G7A18
A. A series of DC pulses at twice the frequency of the AC input	(A)
B. A series of DC pulses at the same frequency as the AC input	Page 4-30
C. A sine wave at half the frequency of the AC input	
D. A steady DC voltage	

Figure G7-1 — Refer to this figure for questions G7A19 through G7A24.



G7A24
(C)
Page 4-30

Which symbol in figure G7-1 represents a single pole switch?

- A. Symbol 2
- B. Symbol 3
- C. Symbol 11
- D. Symbol 12

BATTERIES AND CHARGERS

G4E07
(C)
Page 4-36

When might a lead-acid storage battery give off explosive hydrogen gas?

- A. When stored for long periods of time
- B. When being discharged
- C. When being charged
- D. When not placed on a level surface

G6B13
(B)
Page 4-35

What is an advantage of the low internal resistance of Nickel Cadmium batteries?

- A. Long life
- B. High discharge current
- C. High voltage
- D. Rapid recharge

G6B14
(C)
Page 4-35

What is the minimum allowable discharge voltage for maximum life of a standard 12 volt lead acid battery?

- A. 6 volts
- B. 8.5 volts
- C. 10.5 volts
- D. 12 volts

G6B15
(D)
Page 4-36

When is it acceptable to recharge a carbon-zinc primary cell?

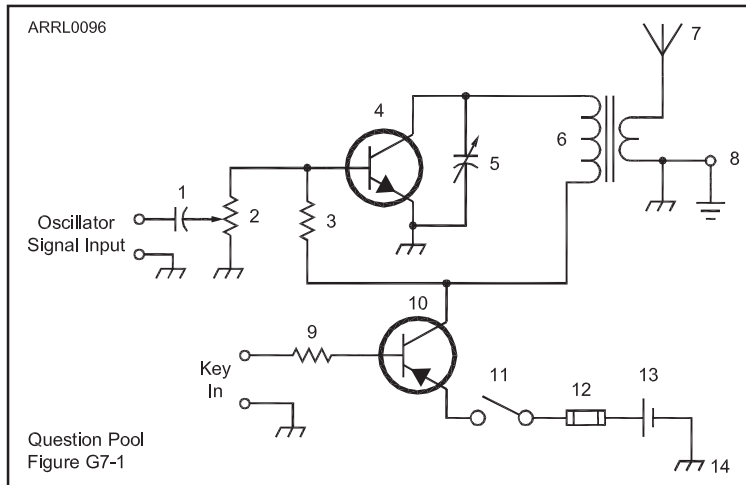
- A. As long as the voltage has not been allowed to drop below 1.0 volt
- B. When the cell is kept warm during the recharging period
- C. When a constant current charger is used
- D. Never

Which of the following is a rechargeable battery?

- A. Carbon-zinc
- B. Silver oxide
- C. Nickel Metal Hydride
- D. Mercury

G6B16
(C)
Page 4-35

Figure G7-1 — Refer to this figure for questions G7A19 through G7A24.



Which symbol in figure G7-1 represents a single cell battery?

- A. Symbol 5
- B. Symbol 12
- C. Symbol 8
- D. Symbol 13

G7A20
(D)
Page 4-35

ALTERNATIVE POWER

What is the name of the process by which sunlight is changed directly into electricity?

- A. Photovoltaic conversion
- B. Photon emission
- C. Photosynthesis
- D. Photon decomposition

G4E08
(A)
Page 4-36

What is the approximate open-circuit voltage from a modern, well illuminated photovoltaic cell?

- A. 0.02 VDC
- B. 0.5 VDC
- C. 0.2 VDC
- D. 1.38 VDC

G4E09
(B)
Page 4-36

Which of these materials is used as the active element of a solar cell?

- A. Doped Silicon
- B. Nickel Hydride
- C. Doped Platinum
- D. Aluminum nitride

G4E10
(A)
Page 4-36

G4E11
(C)
Page 4-36

- Which of the following is a disadvantage to using wind power as the primary source of power for an emergency station?
- A. The conversion efficiency from mechanical energy to electrical energy is less than 2 percent
 - B. The voltage and current ratings of such systems are not compatible with amateur equipment
 - C. A large energy storage system is needed to supply power when the wind is not blowing
 - D. All of these choices are correct

CONNECTORS

G4D07
(A)
Page 4-39

- Which of the following describes a Type-N connector?
- A. A moisture resistant RF connector useful to 10 GHz
 - B. A small bayonet connector used for data circuits
 - C. A threaded connector used for hydraulic systems
 - D. An audio connector used in surround sound installations

G4D08
(D)
Page 4-39

- Which of the following connectors would be a good choice for a serial data port?
- A. PL-259
 - B. Type N
 - C. Type SMA
 - D. DB

G4D09
(C)
Page 4-39

- Which of these connector types is commonly used for RF service at frequencies up to 150 MHz?
- A. Octal
 - B. RJ
 - C. UHF
 - D. DB

G4D10
(C)
Page 4-38

- Which of these connector types is commonly used for audio signals in amateur radio stations?
- A. PL-259
 - B. BNC
 - C. RCA Phono
 - D. Type N

G4D11
(B)
Page 4-37

- What is the main reason to use keyed connectors over non-keyed types?
- A. Prevention of use by unauthorized persons
 - B. Reduced chance of damage due to incorrect mating
 - C. Higher current carrying capacity
 - D. All of these choices are correct

Section 4.7

ANALOG AND DIGITAL METERS

G4B07
(C)
Page 4-40

- What is an advantage of a digital voltmeter as compared to an analog voltmeter?
- A. Better for measuring computer circuits
 - B. Better for RF measurements
 - C. Significantly better precision for most uses
 - D. Faster response

Why is high input impedance desirable for a voltmeter?	G4B16
A. It improves the frequency response	(D)
B. It decreases battery consumption in the meter	Page 4-41
C. It improves the resolution of the readings	
D. It decreases the loading on circuits being measured	

OSCILLOSCOPE

What item of test equipment contains horizontal and vertical channel amplifiers?	G4B01
A. An ohmmeter	(D)
B. A signal generator	Page 4-41
C. An ammeter	
D. An oscilloscope	

Which of the following is an advantage of an oscilloscope versus a digital voltmeter?	G4B02
A. An oscilloscope uses less power	(D)
B. Complex impedances can be easily measured	Page 4-41
C. Input impedance is much lower	
D. Complex waveforms can be measured	

Which of the following is the best instrument to use to check the keying waveform of a CW transmitter?	G4B05
A. A monitoring oscilloscope	(A)
B. A field-strength meter	Page 4-41
C. A sidetone monitor	
D. A wavemeter	

What signal source is connected to the vertical input of a monitoring oscilloscope when checking the quality of a transmitted signal?	G4B06
A. The local oscillator of the transmitter	(D)
B. The audio input of the transmitter	Page 4-41
C. The transmitter balanced mixer output	
D. The attenuated RF output of the transmitter	

SIGNAL GENERATORS AND TRACERS

How would a signal tracer normally be used?	G4B03
A. To identify the source of radio transmissions	(D)
B. To make exact drawings of signal waveforms	Page 4-42
C. To show standing wave patterns on open-wire feed-lines	
D. To identify an inoperative stage in a receiver	

IMPEDANCE AND RESONANCE MEASUREMENTS

How is a noise bridge normally used?	G4B04
A. It is connected at an antenna's feed point and reads the antenna's noise figure	(C)
B. It is connected between a transmitter and an antenna and tuned for minimum SWR	Page 4-43
C. It is connected between a receiver and an antenna of unknown impedance and is adjusted for minimum noise	

D. It is connected between an antenna and ground and tuned for minimum SWR	G4B12
What is one way a noise bridge might be used?	(B)
A. Determining an antenna's gain in dBi	Page 4-43
B. Pre-tuning an antenna tuner	
C. Pre-tuning a linear amplifier	
D. Determining the line loss of the antenna system	

G4B13
(A)
Page 4-43

What is one measurement that can be made with a dip meter?

- A. The resonant frequency of a circuit
- B. The tilt of the ionosphere
- C. The gain of an antenna
- D. The notch depth of a filter

G4B14
(C)
Page 4-43

Which of the following must be connected to an antenna analyzer when it is being used for SWR measurements?

- A. Receiver
- B. Transmitter
- C. Antenna and feedline
- D. All of these answers are correct

FIELD STRENGTH AND RF POWER METERS

G4B08
(A)
Page 4-44

What instrument may be used to monitor relative RF output when making antenna and transmitter adjustments?

- A. A field-strength meter
- B. An antenna noise bridge
- C. A multimeter
- D. A Q meter

G4B10
(B)
Page 4-44

Which of the following can be determined with a field strength meter?

- A. The radiation resistance of an antenna
- B. The radiation pattern of an antenna
- C. The presence and amount of phase distortion of a transmitter
- D. The presence and amount of amplitude distortion of a transmitter

G4B11
(A)
Page 4-44

Which of the following might be a use for a field strength meter?

- A. Close-in radio direction-finding
- B. A modulation monitor for a frequency or phase modulation transmitter
- C. An overmodulation indicator for a SSB transmitter
- D. A keying indicator for a RTTY or packet transmitter

G4B15
(A)
Page 4-44

Which of the following can be measured with a directional wattmeter?

- A. Standing Wave Ratio
- B. Antenna front-to-back ratio
- C. RF interference
- D. Radio wave propagation