

Tech Quiz 2014 - 2018

1 1 T0A04 What is the purpose of a fuse in an electrical circuit?

- A. To prevent power supply ripple from damaging a circuit
- B. To interrupt power in case of overload
- C. To limit current to prevent shocks
- D. All of these choices are correct

1 2 T0B04 Which of the following is an important safety precaution to observe when putting up an antenna tower?

- A. Wear a ground strap connected to your wrist at all times
- B. Insulate the base of the tower to avoid lightning strikes
- C. Look for and stay clear of any overhead electrical wires
- D. All of these choices are correct

1 3 T0C01 What type of radiation are VHF and UHF radio signals?

- A. Gamma radiation
- B. Ionizing radiation
- C. Alpha radiation
- D. Non-ionizing radiation

1 4 T1A03 Which part of the FCC regulations contains the rules governing the Amateur Radio Service?

- A. Part 73
- B. Part 95
- C. Part 90
- D. Part 97

1 5 T1B04 Which amateur band are you using when your station is transmitting on 146.52 MHz?

- A. 2 meter band
- B. 20 meter band
- C. 14 meter band
- D. 6 meter band

1 6 T1C04 When are you allowed to operate your amateur station in a foreign country?

- A. When the foreign country authorizes it
- B. When there is a mutual agreement allowing third party communications
- C. When authorization permits amateur communications in a foreign language
- D. When you are communicating with non-licensed individuals in another country

1 7 T1D01 With which countries are FCC-licensed amateur stations prohibited from exchanging communications?

- A. Any country whose administration has notified the ITU that it objects to such communications
- B. Any country whose administration has notified the ARRL that it objects to such communications
- C. Any country engaged in hostilities with another country
- D. Any country in violation of the War Powers Act of 1934

1 8 T1E03 Who must designate the station control operator?

- A. The station licensee
- B. The FCC
- C. The frequency coordinator
- D. The ITU

1 9 T1F01 What type of identification is being used when identifying a station on the air as Race Headquarters?

- A. Tactical call sign
- B. An official call sign reserved for RACES drills
- C. SSID
- D. Broadcast station

1 10 T2A01 What is the most common repeater frequency offset in the 2 meter band?

- A. Plus 500 kHz
- B. Plus or minus 600 kHz
- C. Minus 500 kHz
- D. Only plus 600 kHz

1 11 T2B02 What is the term used to describe the use of a sub-audible tone transmitted with normal voice audio to open the squelch of a receiver?

- A. Carrier squelch
- B. Tone burst
- C. DTMF
- D. CTCSS

1 12 T2C01 When do the FCC rules NOT apply to the operation of an amateur station?

- A. When operating a RACES station
- B. When operating under special FEMA rules
- C. When operating under special ARES rules
- D. Never, FCC rules always apply

1 13 T3A01 What should you do if another operator reports that your station's 2 meter signals were strong just a moment ago, but now they are weak or distorted?

- A. Change the batteries in your radio to a different type
- B. Turn on the CTCSS tone
- C. Ask the other operator to adjust his squelch control
- D. Try moving a few feet or changing the direction of your antenna if possible, as reflections may be causing multi-path distortion

1 14 T3B03 What are the two components of a radio wave?

- A. AC and DC
- B. Voltage and current
- C. Electric and magnetic fields
- D. Ionizing and non-ionizing radiation

1 15 T3C03 What is a characteristic of VHF signals received via auroral reflection?

- A. Signals from distances of 10,000 or more miles are common
- B. The signals exhibit rapid fluctuations of strength and often sound distorted
- C. These types of signals occur only during winter nighttime hours

D. These types of signals are generally strongest when your antenna is aimed west

1 16 T4A05 Where should an in-line SWR meter be connected to monitor the standing wave ratio of the station antenna system?

- A. In series with the feed line, between the transmitter and antenna
- B. In series with the station's ground
- C. In parallel with the push-to-talk line and the antenna
- D. In series with the power supply cable, as close as possible to the radio

1 17 T4B02 Which of the following can be used to enter the operating frequency on a modern transceiver?

- A. The keypad or VFO knob
- B. The CTCSS or DTMF encoder
- C. The Automatic Frequency Control
- D. All of these choices are correct

1 18 T5A02 Electrical power is measured in which of the following units?

- A. Volts
- B. Watts
- C. Ohms
- D. Amperes

1 19 T5B02 What is another way to specify a radio signal frequency of 1,500,000 hertz?

- A. 1500 kHz
- B. 1500 MHz
- C. 15 GHz
- D. 150 kHz

1 20 T5C01 What is the ability to store energy in an electric field called?

- A. Inductance
- B. Resistance
- C. Tolerance
- D. Capacitance

1 21 T5D05 What is the resistance in a circuit for which the applied voltage is 12 volts and the current flow is 1.5 amperes?

- A. 18 ohms
- B. 0.125 ohms
- C. 8 ohms
- D. 13.5 ohms

1 22 T6A01 What electrical component is used to oppose the flow of current in a DC circuit?

- A. Inductor
- B. Resistor
- C. Voltmeter
- D. Transformer

1 23 T6B01 What class of electronic components is capable of using a voltage or current signal to control current flow?

- A. Capacitors
- B. Inductors
- C. Resistors
- D. Transistors

1 24 T6C01 What is the name for standardized representations of components in an electrical wiring diagram?

- A. Electrical depictions
- B. Grey sketch
- C. Schematic symbols
- D. Component callouts

1 25 T6D02 What best describes a relay?

- A. A switch controlled by an electromagnet
- B. A current controlled amplifier
- C. An optical sensor
- D. A pass transistor

1 26 T7A03 Which of the following is used to convert a radio signal from one frequency to another?

- A. Phase splitter
- B. Mixer
- C. Inverter
- D. Amplifier

1 27 T7B02 What would cause a broadcast AM or FM radio to receive an amateur radio transmission unintentionally?

- A. The receiver is unable to reject strong signals outside the AM or FM band
- B. The microphone gain of the transmitter is turned up too high
- C. The audio amplifier of the transmitter is overloaded
- D. The deviation of an FM transmitter is set too low

1 28 T7C02 Which of the following instruments can be used to determine if an antenna is resonant at the desired operating frequency?

- A. A VTVM
- B. An antenna analyzer
- C. A Q meter
- D. A frequency counter

1 29 T7D02 What is the correct way to connect a voltmeter to a circuit?

- A. In series with the circuit
- B. In parallel with the circuit
- C. In quadrature with the circuit
- D. In phase with the circuit

1 30 T8A04 Which type of modulation is most commonly used for VHF and UHF voice repeaters?

- A. AM
- B. SSB
- C. PSK
- D. FM

1 31 T8B01 Who may be the control operator of a station communicating through an amateur satellite or space station?

- A. Only an Amateur Extra Class operator
- B. A General Class licensee or higher licensee who has a satellite operator certification
- C. Only an Amateur Extra Class operator who is also an AMSAT member
- D. Any amateur whose license privileges allow them to transmit on the satellite uplink frequency

1 32 T8C01 Which of the following methods is used to locate sources of noise interference or jamming?

- A. Echolocation
- B. Doppler radar
- C. Radio direction finding
- D. Phase locking

1 33 T8D01 Which of the following is an example of a digital communications method?
A. Packet B. PSK31 C. MFSK D. All of these choices are correct

1 34 T9A01 What is a beam antenna?
A. An antenna built from aluminum I-beams
B. An omnidirectional antenna invented by Clarence Beam
C. An antenna that concentrates signals in one direction
D. An antenna that reverses the phase of received signals

1 35 T9B03 Why is coaxial cable used more often than any other feed line for amateur radio antenna systems?
A. It is easy to use and requires few special installation considerations
B. It has less loss than any other type of feed line
C. It can handle more power than any other type of feed line
D. It is less expensive than any other types of feed line

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|---|----|-----------|
| 1 | 1 | T0A04 (B) |
| 1 | 2 | T0B04 (C) |
| 1 | 3 | T0C01 (D) |
| 1 | 4 | T1A03 (D) |
| 1 | 5 | T1B04 (A) |
| 1 | 6 | T1C04 (A) |
| 1 | 7 | T1D01 (A) |
| 1 | 8 | T1E03 (A) |
| 1 | 9 | T1F01 (A) |
| 1 | 10 | T2A01 (B) |
| 1 | 11 | T2B02 (D) |
| 1 | 12 | T2C01 (D) |
| 1 | 13 | T3A01 (D) |
| 1 | 14 | T3B03 (C) |
| 1 | 15 | T3C03 (B) |
| 1 | 16 | T4A05 (A) |
| 1 | 17 | T4B02 (A) |
| 1 | 18 | T5A02 (B) |
| 1 | 19 | T5B02 (A) |
| 1 | 20 | T5C01 (D) |
| 1 | 21 | T5D05 (C) |
| 1 | 22 | T6A01 (B) |
| 1 | 23 | T6B01 (D) |
| 1 | 24 | T6C01 (C) |
| 1 | 25 | T6D02 (A) |
| 1 | 26 | T7A03 (B) |
| 1 | 27 | T7B02 (A) |
| 1 | 28 | T7C02 (B) |
| 1 | 29 | T7D02 (B) |
| 1 | 30 | T8A04 (D) |
| 1 | 31 | T8B01 (D) |
| 1 | 32 | T8C01 (C) |
| 1 | 33 | T8D01 (D) |
| 1 | 34 | T9A01 (C) |
| 1 | 35 | T9B03 (A) |

2 1 T0A05 Why is it unwise to install a 20-ampere fuse in the place of a 5-ampere fuse?

- A. The larger fuse would be likely to blow because it is rated for higher current
- B. The power supply ripple would greatly increase
- C. Excessive current could cause a fire
- D. All of these choices are correct

2 2 T0B06 What is the minimum safe distance from a power line to allow when installing an antenna?

- A. Half the width of your property
- B. The height of the power line above ground
- C. 1/2 wavelength at the operating frequency
- D. So that if the antenna falls unexpectedly, no part of it can come closer than 10 feet to the power wires

2 3 T0C05 Why do exposure limits vary with frequency?

- A. Lower frequency RF fields have more energy than higher frequency fields
- B. Lower frequency RF fields do not penetrate the human body
- C. Higher frequency RF fields are transient in nature
- D. The human body absorbs more RF energy at some frequencies than at others

2 4 T1A05 Which of the following is a purpose of the Amateur Radio Service rules and regulations as defined by the FCC?

- A. Enhancing international goodwill
- B. Providing inexpensive communication for local emergency organizations
- C. Training of operators in military radio operating procedures
- D. All of these choices are correct

2 5 T1B07 What amateur band are you using if you are transmitting on 223.50 MHz?

- A. 15 meter band
- B. 10 meter band
- C. 2 meter band
- D. 1.25 meter band

2 6 T1C06 From which of the following locations may an FCC-licensed amateur station transmit, in addition to places where the FCC regulates communications?

- A. From within any country that belongs to the International Telecommunications Union
- B. From within any country that is a member of the United Nations
- C. From anywhere within in ITU Regions 2 and 3
- D. From any vessel or craft located in international waters and documented or registered in the United States

2 7 T1D02 On which of the following occasions may an FCC-licensed amateur station exchange messages with a U.S. military station?

- A. During an Armed Forces Day Communications Test
- B. During a Memorial Day Celebration

- C. During an Independence Day celebration
- D. During a propagation test

2 8 T1E05 What is an amateur station control point?

- A. The location of the station's transmitting antenna
- B. The location of the station transmitting apparatus
- C. The location at which the control operator function is performed
- D. The mailing address of the station licensee

2 9 T1F03 When is an amateur station required to transmit its assigned call sign?

- A. At the beginning of each contact, and every 10 minutes thereafter
- B. At least once during each transmission
- C. At least every 15 minutes during and at the end of a communication
- D. At least every 10 minutes during and at the end of a communication

2 10 T2A02 What is the national calling frequency for FM simplex operations in the 70 cm band?

- A. 146.520 MHz
- B. 145.000 MHz
- C. 432.100 MHz
- D. 446.000 MHz

2 11 T2B07 What could cause your FM signal to interfere with stations on nearby frequencies?

- A. Microphone gain too high, causing over-deviation
- B. SWR too high
- C. Incorrect CTCSS Tone
- D. All of these choices are correct

2 12 T2C03 What should be done to insure that voice message traffic containing proper names and unusual words are copied correctly by the receiving station?

- A. The entire message should be repeated at least four times
- B. Such messages must be limited to no more than 10 words
- C. Such words and terms should be spelled out using a standard phonetic alphabet
- D. All of these choices are correct

2 13 T3A02 Why are UHF signals often more effective from inside buildings than VHF signals?

- A. VHF signals lose power faster over distance
- B. The shorter wavelength allows them to more easily penetrate the structure of buildings
- C. This is incorrect; VHF works better than UHF inside buildings
- D. UHF antennas are more efficient than VHF antennas

2 14 T3B04 How fast does a radio wave travel through free space?

- A. At the speed of light
- B. At the speed of sound
- C. Its speed is inversely proportional to its wavelength
- D. Its speed increases as the frequency increases

2 15 T3C06 What mode is responsible for allowing over-the-horizon VHF and UHF communications to ranges of approximately 300 miles on a regular basis?

- A. Tropospheric scatter
- B. D layer refraction
- C. F2 layer refraction
- D. Faraday rotation

2 16 T4A06 Which of the following would be connected between a transceiver and computer in a packet radio station?

- A. Transmatch
- B. Mixer
- C. Terminal node controller
- D. Antenna

2 17 T4B03 What is the purpose of the squelch control on a transceiver?

- A. To set the highest level of volume desired
- B. To set the transmitter power level
- C. To adjust the automatic gain control
- D. To mute receiver output noise when no signal is being received

2 18 T5A03 What is the name for the flow of electrons in an electric circuit?

- A. Voltage
- B. Resistance
- C. Capacitance
- D. Current

2 19 T5B06 If an ammeter calibrated in amperes is used to measure a 3000-milliampere current, what reading would it show?

- A. 0.003 amperes
- B. 0.3 amperes
- C. 3 amperes
- D. 3,000,000 amperes

2 20 T5C02 What is the basic unit of capacitance?

- A. The farad
- B. The ohm
- C. The volt
- D. The henry

2 21 T5D06 What is the resistance of a circuit that draws 4 amperes from a 12-volt source?

- A. 3 ohms
- B. 16 ohms
- C. 48 ohms
- D. 8 Ohms

2 22 T6A03 What electrical parameter is controlled by a potentiometer?

- A. Inductance
- B. Resistance
- C. Capacitance
- D. Field strength

2 23 T6B03 Which of these components can be used as an electronic switch or amplifier?

- A. Oscillator
- B. Potentiometer
- C. Transistor
- D. Voltmeter

2 24 T6C05 What is component 4 in figure T1?

- A. Resistor
- B. Transistor
- C. Battery
- D. Ground symbol

2 25 T6D06 What component is commonly used to change 120V AC house current to a lower AC voltage for other uses?

- A. Variable capacitor
- B. Transformer
- C. Transistor
- D. Diode

2 26 T7A04 Which term describes the ability of a receiver to discriminate between multiple signals?

- A. Discrimination ratio
- B. Sensitivity
- C. Selectivity
- D. Harmonic Distortion

2 27 T7B03 Which of the following may be a cause of radio frequency interference?

- A. Fundamental overload
- B. Harmonics
- C. Spurious emissions
- D. All of these choices are correct

2 28 T7C07 What happens to power lost in a feed line?

- A. It increases the SWR
- B. It comes back into your transmitter and could cause damage
- C. It is converted into heat
- D. It can cause distortion of your signal

2 29 T7D03 How is an ammeter usually connected to a circuit?

- A. In series with the circuit
- B. In parallel with the circuit
- C. In quadrature with the circuit
- D. In phase with the circuit

2 30 T8A06 Which sideband is normally used for 10 meter HF, VHF and UHF single-sideband communications?

- A. Upper sideband
- B. Lower sideband
- C. Suppressed sideband
- D. Inverted sideband

2 31 T8B04 Which amateur stations may make contact with an amateur station on the International Space Station using 2 meter and 70 cm band amateur radio frequencies?

- A. Only members of amateur radio clubs at NASA facilities
- B. Any amateur holding a Technician or higher class license
- C. Only the astronaut's family members who are hams
- D. You cannot talk to the ISS on amateur radio frequencies

2 32 T8C04 Which of the following is good procedure when contacting another station in a radio contest?

- A. Be sure to sign only the last two letters of your call if there is a pileup calling the station
- B. Work the station twice to be sure that you are in his log
- C. Send only the minimum information needed for proper identification and the contest exchange
- D. All of these choices are correct

2 33 T8D02 What does the term "APRS" mean?

- A. Automatic Packet Reporting System
- B. Associated Public Radio Station
- C. Auto Planning Radio Set-up
- D. Advanced Polar Radio System

2 34 T9A04 What is a disadvantage of the "rubber duck" antenna supplied with most handheld radio transceivers?

- A. It does not transmit or receive as effectively as a full-sized antenna
- B. It transmits a circularly polarized signal
- C. If the rubber end cap is lost it will unravel very quickly
- D. All of these choices are correct

2 35 T9B04 What does an antenna tuner do?

- A. It matches the antenna system impedance to the transceiver's output impedance
- B. It helps a receiver automatically tune in weak stations
- C. It allows an antenna to be used on both transmit and receive
- D. It automatically selects the proper antenna for the frequency band being used

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|---|----|-----------|
| 2 | 1 | T0A05 (C) |
| 2 | 2 | T0B06 (D) |
| 2 | 3 | T0C05 (D) |
| 2 | 4 | T1A05 (A) |
| 2 | 5 | T1B07 (D) |
| 2 | 6 | T1C06 (D) |
| 2 | 7 | T1D02(A) |
| 2 | 8 | T1E05 (C) |
| 2 | 9 | T1F03 (D) |
| 2 | 10 | T2A02 (D) |
| 2 | 11 | T2B07 (A) |
| 2 | 12 | T2C03 (C) |
| 2 | 13 | T3A02 (B) |
| 2 | 14 | T3B04 (A) |
| 2 | 15 | T3C06 (A) |
| 2 | 16 | T4A06 (C) |
| 2 | 17 | T4B03 (D) |
| 2 | 18 | T5A03 (D) |
| 2 | 19 | T5B06 (C) |
| 2 | 20 | T5C02 (A) |
| 2 | 21 | T5D06(A) |
| 2 | 22 | T6A03 (B) |
| 2 | 23 | T6B03 (C) |
| 2 | 24 | T6C05 (C) |
| 2 | 25 | T6D06(B) |
| 2 | 26 | T7A04 (C) |
| 2 | 27 | T7B03 (D) |
| 2 | 28 | T7C07 (C) |
| 2 | 29 | T7D03(A) |
| 2 | 30 | T8A06 (A) |
| 2 | 31 | T8B04 (B) |
| 2 | 32 | T8C04 (C) |
| 2 | 33 | T8D02(A) |
| 2 | 34 | T9A04 (A) |
| 2 | 35 | T9B04 (A) |

3 1 T0A07 Which of these precautions should be taken when installing devices for lightning protection in a coaxial cable feed line?

- A. Include a parallel bypass switch for each protector so that it can be switched out of the circuit when running high power
- B. Include a series switch in the ground line of each protector to prevent RF overload from inadvertently damaging the protector
- C. Keep the ground wires from each protector separate and connected to station ground
- D. Ground all of the protectors to a common plate which is in turn connected to an external ground

3 2 T0B07 Which of the following is an important safety rule to remember when using a crank-up tower?

- A. This type of tower must never be painted
- B. This type of tower must never be grounded
- C. This type of tower must never be climbed unless it is in the fully retracted position
- D. All of these choices are correct

3 3 T0C06 Which of the following is an acceptable method to determine that your station complies with FCC RF exposure regulations?

- A. By calculation based on FCC OET Bulletin 65
- B. By calculation based on computer modeling
- C. By measurement of field strength using calibrated equipment
- D. All of these choices are correct

3 4 T1A07 What is the FCC Part 97 definition of telemetry?

- A. An information bulletin issued by the FCC
- B. A one-way transmission to initiate, modify or terminate functions of a device at a distance
- C. A one-way transmission of measurements at a distance from the measuring instrument
- D. An information bulletin from a VEC

3 5 T1B08 Which of the following is a result of the fact that the amateur service is secondary in some portions of the 70 cm band?

- A. U.S. amateurs may find non-amateur stations in the bands, and must avoid interfering with them
- B. U.S. amateurs must give foreign amateur stations priority in those portions
- C. International communications are not permitted on 70 cm
- D. Digital transmissions are not permitted on 70 cm

3 6 T1C09 What is the grace period following the expiration of an amateur license within which the license may be renewed?

- A. Two years
- B. Three years
- C. Five years
- D. Ten years

3 7 T1D04 What is the only time an amateur station is authorized to transmit music?

- A. When incidental to an authorized retransmission of manned spacecraft communications
- B. When the music produces no spurious emissions
- C. When the purpose is to interfere with an illegal transmission
- D. When the music is transmitted above 1280 MHz

3 8 T1E08 Which of the following is an example of automatic control?

- A. Repeater operation
- B. Controlling the station over the Internet
- C. Using a computer or other device to automatically send CW
- D. Using a computer or other device to automatically identify

3 9 T1F09 What type of amateur station simultaneously retransmits the signal of another amateur station on a different channel or channels?

- A. Beacon station
- B. Earth station
- C. Repeater station
- D. Message forwarding station

3 10 T2A07 Which of the following is true when making a test transmission?

- A. Station identification is not required if the transmission is less than 15 seconds
- B. Station identification is not required if the transmission is less than 1 watt
- C. Station identification is only required once an hour when the transmissions are for test purposes only
- D. Station identification is required at least every ten minutes during the test and at the end of the test

3 11 T2B09 Which of the following methods is encouraged by the FCC when identifying your station when using phone?

- A. Use of a phonetic alphabet
- B. Send your call sign in CW as well as voice
- C. Repeat your call sign three times
- D. Increase your signal to full power when identifying

3 12 T2C08 Which of the following is a characteristic of good emergency traffic handling?

- A. Passing messages exactly as received
- B. Making decisions as to whether or not messages should be relayed or delivered
- C. Communicating messages to the news media for broadcast outside the disaster area
- D. All of these choices are correct

3 13 T3A05 When using a directional antenna, how might your station be able to access a distant repeater if buildings or obstructions are blocking the direct line of sight path?

- A. Change from vertical to horizontal polarization
- B. Try to find a path that reflects signals to the repeater
- C. Try the long path
- D. Increase the antenna SWR

3 14 T3B07 What property of radio waves is often used to identify the different frequency bands?

- A. The approximate wavelength
- B. The magnetic intensity of waves
- C. The time it takes for waves to travel one mile
- D. The voltage standing wave ratio of waves

3 15 T3C08 What causes tropospheric ducting?

- A. Discharges of lightning during electrical storms
- B. Sunspots and solar flares
- C. Updrafts from hurricanes and tornadoes
- D. Temperature inversions in the atmosphere

3 16 T4A07 How is a computer's sound card used when conducting digital communications using a computer?

- A. The sound card communicates between the computer CPU and the video display
- B. The sound card records the audio frequency for video display
- C. The sound card provides audio to the microphone input and converts received audio to digital form
- D. All of these choices are correct

3 17 T4B04 What is a way to enable quick access to a favorite frequency on your transceiver?

- A. Enable the CTCSS tones
- B. Store the frequency in a memory channel
- C. Disable the CTCSS tones
- D. Use the scan mode to select the desired frequency

3 18 T5A04 What is the name for a current that flows only in one direction?

- A. Alternating current
- B. Direct current
- C. Normal current
- D. Smooth current

3 19 T5B07 If a frequency readout calibrated in megahertz shows a reading of 3.525 MHz, what would it show if it were calibrated in kilohertz?

- A. 0.003525 kHz
- B. 35.25 kHz

- C. 3525 kHz
- D. 3,525,000 kHz

3 20 T5C04 What is the basic unit of inductance?

- A. The coulomb
- B. The farad
- C. The henry
- D. The ohm

3 21 T5D10 What is the voltage across a 2-ohm resistor if a current of 0.5 amperes flows through it?

- A. 1 volt
- B. 0.25 volts
- C. 2.5 volts
- D. 1.5 volts

3 22 T6A05 What type of electrical component consists of two or more conductive surfaces separated by an insulator?

- A. Resistor
- B. Potentiometer
- C. Oscillator
- D. Capacitor

3 23 T6B05 Which of the following electronic components can amplify signals?

- A. Transistor
- B. Variable resistor
- C. Electrolytic capacitor
- D. Multi-cell battery

3 24 T6C10 What is component 3 in figure T3?

- A. Connector
- B. Meter
- C. Variable capacitor
- D. Variable inductor

3 25 T6D07 Which of the following is commonly used as a visual indicator?

- A. LED
- B. FET
- C. Zener diode
- D. Bipolar transistor

3 26 T7A05 What is the name of a circuit that generates a signal of a desired frequency?

- A. Reactance modulator
- B. Product detector
- C. Low-pass filter
- D. Oscillator

3 27 T7B05 How can overload of a non-amateur radio or TV receiver by an amateur signal be reduced or eliminated?

- A. Block the amateur signal with a filter at the antenna input of the affected receiver
- B. Block the interfering signal with a filter on the amateur transmitter
- C. Switch the transmitter from FM to SSB
- D. Switch the transmitter to a narrow-band mode

3 28 T7C08 What instrument other than an SWR meter could you use to determine if a feed line and antenna are properly matched?

- A. Voltmeter
- B. Ohmmeter
- C. Iambic pentameter
- D. Directional wattmeter

3 29 T7D05 What instrument is used to measure resistance?

- A. An oscilloscope
- B. A spectrum analyzer
- C. A noise bridge
- D. An ohmmeter

3 30 T8A07 What is the primary advantage of single sideband over FM for voice transmissions?

- A. SSB signals are easier to tune
- B. SSB signals are less susceptible to interference
- C. SSB signals have narrower bandwidth
- D. All of these choices are correct

3 31 T8B06 Which of the following are inputs to a satellite tracking program?

- A. The weight of the satellite
- B. The Keplerian elements
- C. The last observed time of zero Doppler shift
- D. All of these answers are correct

3 32 T8C06 How is access to an IRLP node accomplished?

- A. By obtaining a password which is sent via voice to the node
- B. By using DTMF signals
- C. By entering the proper Internet password
- D. By using CTCSS tone codes

3 33 T8D03 Which of the following devices provides data to the transmitter when sending automatic position reports from a mobile amateur radio station?

- A. The vehicle speedometer
- B. A WWV receiver
- C. A connection to a broadcast FM sub-carrier receiver
- D. A Global Positioning System receiver

3 34 T9A05 How would you change a dipole antenna to make it resonant on a higher frequency?

- A. Lengthen it
- B. Insert coils in series with radiating wires
- C. Shorten it
- D. Add capacitive loading to the ends of the radiating wires

3 35 T9B05 What generally happens as the frequency of a signal passing through coaxial cable is increased?

- A. The apparent SWR increases
- B. The reflected power increases
- C. The characteristic impedance increases
- D. The loss increases

| | | | |
|---|----|-----------|-----|
| 3 | 1 | T0A07 (D) | |
| 3 | 2 | T0B07 (C) | |
| 3 | 3 | T0C06 (D) | |
| 3 | 4 | T1A07 (C) | |
| 3 | 5 | T1B08 (A) | |
| 3 | 6 | T1C09 (A) | |
| 3 | 7 | T1D04 (A) | |
| 3 | 8 | T1E08 | (A) |
| 3 | 9 | T1F09 (C) | |
| 3 | 10 | T2A07 (D) | |
| 3 | 11 | T2B09 (A) | |
| 3 | 12 | T2C08 (A) | |
| 3 | 13 | T3A05 (B) | |
| 3 | 14 | T3B07 (A) | |
| 3 | 15 | T3C08 (D) | |
| 3 | 16 | T4A07 (C) | |
| 3 | 17 | T4B04 (B) | |
| 3 | 18 | T5A04 (B) | |
| 3 | 19 | T5B07 (C) | |
| 3 | 20 | T5C04 (C) | |
| 3 | 21 | T5D10 (A) | |
| 3 | 22 | T6A05 (D) | |
| 3 | 23 | T6B05 (A) | |
| 3 | 24 | T6C10 (D) | |
| 3 | 25 | T6D07 (A) | |
| 3 | 26 | T7A05 (D) | |
| 3 | 27 | T7B05 (A) | |
| 3 | 28 | T7C08 (D) | |
| 3 | 29 | T7D05 (D) | |
| 3 | 30 | T8A07 (C) | |
| 3 | 31 | T8B06 (B) | |
| 3 | 32 | T8C06 (B) | |
| 3 | 33 | T8D03 (D) | |
| 3 | 34 | T9A05 (C) | |
| 3 | 35 | T9B05 (D) | |

4 1 T0A08 What safety equipment should always be included in home-built equipment that is powered from 120V AC power circuits?

- A. A fuse or circuit breaker in series with the AC hot conductor
- B. An AC voltmeter across the incoming power source
- C. An inductor in series with the AC power source
- D. A capacitor across the AC power source

4 2 T0B08 What is considered to be a proper grounding method for a tower?

- A. A single four-foot ground rod, driven into the ground no more than 12 inches from the base
- B. A ferrite-core RF choke connected between the tower and ground
- C. Separate eight-foot long ground rods for each tower leg, bonded to the tower and each other
- D. A connection between the tower base and a cold water pipe

4 3 T0C07 What could happen if a person accidentally touched your antenna while you were transmitting?

- A. Touching the antenna could cause television interference
- B. They might receive a painful RF burn
- C. They might develop radiation poisoning
- D. All of these choices are correct

4 4 T1A12 Which of the following is a permissible use of the Amateur Radio Service?

- A. Broadcasting music and videos to friends
- B. Providing a way for amateur radio operators to earn additional income by using their stations to pass messages
- C. Providing low-cost communications for start-up businesses
- D. Allowing a person to conduct radio experiments and to communicate with other licensed hams around the world

4 5 T1B10 Which of the bands above 30 MHz that are available to Technician Class operators have mode-restricted sub-bands?

- A. The 6 meter, 2 meter, and 70 cm bands
- B. The 2 meter and 13 cm bands
- C. The 6 meter, 2 meter, and 1.25 meter bands
- D. The 2 meter and 70 cm bands

4 6 T1C10 How soon after passing the examination for your first amateur radio license may you operate a transmitter on an amateur service frequency?

- A. Immediately
- B. 30 days after the test date
- C. As soon as your operator/station license grant appears in the FCC's license database
- D. You must wait until you receive your license in the mail from the FCC

4 7 T1D06 What, if any, are the restrictions concerning transmission of language that may be considered indecent or obscene?

- A. The FCC maintains a list of words that are not permitted to be used on amateur frequencies
- B. Any such language is prohibited
- C. The ITU maintains a list of words that are not permitted to be used on amateur frequencies
- D. There is no such prohibition

4 8 T1E11 Who does the FCC presume to be the control operator of an amateur station, unless documentation to the contrary is in the station records?

- A. The station custodian
- B. The third party participant
- C. The person operating the station equipment
- D. The station licensee

4 9 T1F12 How many persons are required to be members of a club for a club station license to be issued by the FCC?

- A. At least 5
- B. At least 4
- C. A trustee and 2 officers
- D. At least 2

4 10 T2A09 What brief statement is often transmitted in place of "CQ" to indicate that you are listening on a repeater?

- A. The words "Hello test" followed by your call sign
- B. Your call sign
- C. The repeater call sign followed by your call sign
- D. The letters "QSY" followed by your call sign

4 11 T2B12 Under what circumstances should you consider communicating via simplex rather than a repeater?

- A. When the stations can communicate directly without using a repeater
- B. Only when you have an endorsement for simplex operation on your license
- C. Only when third party traffic is not being passed
- D. Only if you have simplex modulation capability

4 12 T2C10 What is the preamble in a formal traffic message?

- A. The first paragraph of the message text
- B. The message number
- C. The priority handling indicator for the message
- D. The information needed to track the message as it passes through the amateur radio traffic handling system

4 13 T3A07 What type of wave carries radio signals between transmitting and receiving stations?

- A. Electromagnetic
- B. Electrostatic
- C. Surface acoustic
- D. Magnetostrictive

4 14 T3B08 What are the frequency limits of the VHF spectrum?

- A. 30 to 300 kHz
- B. 30 to 300 MHz
- C. 300 to 3000 kHz
- D. 300 to 3000 MHz

4 15 T3C11 Why do VHF and UHF radio signals usually travel somewhat farther than the visual line of sight distance between two stations?

- A. Radio signals move somewhat faster than the speed of light
- B. Radio waves are not blocked by dust particles
- C. The Earth seems less curved to radio waves than to light
- D. Radio waves are blocked by dust particles

4 16 T4A10 What is the source of a high-pitched whine that varies with engine speed in a mobile transceiver's receive audio?

- A. The ignition system
- B. The alternator
- C. The electric fuel pump
- D. Anti-lock braking system controllers

4 17 T4B06 Which of the following controls could be used if the voice pitch of a single-sideband signal seems too high or low?

- A. The AGC or limiter
- B. The bandwidth selection
- C. The tone squelch
- D. The receiver RIT or clarifier

4 18 T5A05 What is the electrical term for the electromotive force (EMF) that causes electron flow?

- A. Voltage
- B. Ampere-hours
- C. Capacitance
- D. Inductance

4 19 T5B11 What is the approximate amount of change, measured in decibels (dB), of a power increase from 20 watts to 200 watts?

- A. 10 dB
- B. 12 dB
- C. 18 dB
- D. 28 dB

4 20 T5C05 What is the unit of frequency?

- A. Hertz
- B. Henry
- C. Farad
- D. Tesla

4 21 T5D11 What is the voltage across a 10-ohm resistor if a current of 1 ampere flows through it?

- A. 1 volt
- B. 10 volts
- C. 11 volts
- D. 9 volts

4 22 T6A07 What electrical component is usually composed of a coil of wire?

- A. Switch
- B. Capacitor
- C. Diode
- D. Inductor

4 23 T6B07 What does the abbreviation LED stand for?

- A. Low Emission Diode
- B. Light Emitting Diode
- C. Liquid Emission Detector
- D. Long Echo Delay

4 24 T6C12 What do the symbols on an electrical circuit schematic diagram represent?

- A. Electrical components
- B. Logic states
- C. Digital codes
- D. Traffic nodes

4 25 T6D08 Which of the following is used together with an inductor to make a tuned circuit?

- A. Resistor
- B. Zener diode
- C. Potentiometer
- D. Capacitor

4 26 T7A06 What device takes the output of a low-powered 28 MHz SSB exciter and produces a 222 MHz output signal?

- A. High-pass filter
- B. Low-pass filter
- C. Transverter
- D. Phase converter

4 27 T7B06 Which of the following actions should you take if a neighbor tells you that your station's transmissions are interfering with their radio or TV reception?

- A. Make sure that your station is functioning properly and that it does not cause interference to your own radio or television when it is tuned to the same channel
- B. Immediately turn off your transmitter and contact the nearest FCC office for assistance
- C. Tell them that your license gives you the right to transmit and nothing can be done to reduce the interference
- D. Install a harmonic doubler on the output of your transmitter and tune it until the interference is eliminated

4 28 T7C11 What is a disadvantage of air core coaxial cable when compared to foam or solid dielectric types?

- A. It has more loss per foot
- B. It cannot be used for VHF or UHF antennas
- C. It requires special techniques to prevent water absorption
- D. It cannot be used at below freezing temperatures

4 29 T7D06 Which of the following might damage a multimeter?

- A. Measuring a voltage too small for the chosen scale
- B. Leaving the meter in the milliamps position overnight
- C. Attempting to measure voltage when using the resistance setting
- D. Not allowing it to warm up properly

4 30 T8A08 What is the approximate bandwidth of a single sideband voice signal?

- A. 1 kHz
- B. 3 kHz
- C. 6 kHz
- D. 15 kHz

4 31 T8B09 What causes spin fading when referring to satellite signals?

- A. Circular polarized noise interference radiated from the sun
- B. Rotation of the satellite and its antennas
- C. Doppler shift of the received signal
- D. Interfering signals within the satellite uplink band

4 32 T8C09 How might you obtain a list of active nodes that use VoIP?

- A. From the FCC Rulebook
- B. From your local emergency coordinator
- C. From a repeater directory
- D. From the local repeater frequency coordinator

4 33 T8D04 What type of transmission is indicated by the term NTSC?

- A. A Normal Transmission mode in Static Circuit
- B. A special mode for earth satellite uplink
- C. An analog fast scan color TV signal
- D. A frame compression scheme for TV signals

4 34 T9A07 What is a good reason not to use a "rubber duck" antenna inside your car?

- A. Signals can be significantly weaker than when it is outside of the vehicle
- B. It might cause your radio to overheat
- C. The SWR might decrease, decreasing the signal strength
- D. All of these choices are correct

4 35 T9B08 Why should coax connectors exposed to the weather be sealed against water intrusion?

- A. To prevent an increase in feed line loss
- B. To prevent interference to telephones
- C. To keep the jacket from becoming loose
- D. All of these choices are correct

| | | |
|---|----|-----------|
| 4 | 1 | T0A08 (A) |
| 4 | 2 | T0B08 (C) |
| 4 | 3 | T0C07 (B) |
| 4 | 4 | T1A12 (D) |
| 4 | 5 | T1B10 (C) |
| 4 | 6 | T1C10 (C) |
| 4 | 7 | T1D06 (B) |
| 4 | 8 | T1E11 (D) |
| 4 | 9 | T1F12 (B) |
| 4 | 10 | T2A09 (B) |
| 4 | 11 | T2B12 (A) |
| 4 | 12 | T2C10 (D) |
| 4 | 13 | T3A07 (A) |
| 4 | 14 | T3B08 (B) |
| 4 | 15 | T3C11 (C) |
| 4 | 16 | T4A10 (B) |
| 4 | 17 | T4B06 (D) |
| 4 | 18 | T5A05 (A) |
| 4 | 19 | T5B11 (A) |
| 4 | 20 | T5C05 (A) |
| 4 | 21 | T5D11 (B) |
| 4 | 22 | T6A07 (D) |
| 4 | 23 | T6B07 (B) |
| 4 | 24 | T6C12 (A) |
| 4 | 25 | T6D08 (D) |
| 4 | 26 | T7A06 (C) |
| 4 | 27 | T7B06 (A) |
| 4 | 28 | T7C11 (C) |
| 4 | 29 | T7D06 (C) |
| 4 | 30 | T8A08 (B) |
| 4 | 31 | T8B09 (B) |
| 4 | 32 | T8C09 (C) |
| 4 | 33 | T8D04 (C) |
| 4 | 34 | T9A07 (A) |
| 4 | 35 | T9B08 (A) |

5 1 T0A09 What kind of hazard is presented by a conventional 12-volt storage battery?
A. It emits ozone which can be harmful to the atmosphere
B. Shock hazard due to high voltage
C. Explosive gas can collect if not properly vented
D. All of these choices are correct

5 2 T0B12 Which of the following is good practice when installing ground wires on a tower for lightning protection?
A. Put a loop in the ground connection to prevent water damage to the ground system
B. Make sure that all bends in the ground wires are clean, right angle bends
C. Ensure that connections are short and direct
D. All of these choices are correct

5 3 T0C13 If the averaging time for exposure is 6 minutes, how much power density is permitted if the signal is present for 3 minutes and absent for 3 minutes rather than being present for the entire 6 minutes?
A. 3 times as much
B. 1/2 as much
C. 2 times as much
D. There is no adjustment allowed for shorter exposure times

5 4 T1A13 What is the FCC Part 97 definition of telecommand?
A. An instruction bulletin issued by the FCC
B. A one-way radio transmission of measurements at a distance from the measuring instrument
C. A one-way transmission to initiate, modify or terminate functions of a device at a distance
D. An instruction from a VEC

5 5 T1B11 What emission modes are permitted in the mode-restricted sub-bands at 50.0 to 50.1 MHz and 144.0 to 144.1 MHz?
A. CW only B. CW and RTTY C. SSB only D. CW and SSB

5 6 T1C13 For which license classes are new licenses currently available from the FCC?
A. Novice, Technician, General, Advanced
B. Technician, Technician Plus, General, Advanced
C. Novice, Technician Plus, General, Advanced
D. Technician, General, Amateur Extra

5 7 T1D08 In which of the following circumstances may the control operator of an amateur station receive compensation for operating the station?
A. When engaging in communications on behalf of their employer

- B. When the communication is incidental to classroom instruction at an educational institution
- C. When re-broadcasting weather alerts during a RACES net
- D. When notifying other amateur operators of the availability for sale or trade of apparatus

5 8 T1E12 When, under normal circumstances, may a Technician Class licensee be the control operator of a station operating in an exclusive Extra Class operator segment of the amateur bands?

- A. At no time
- B. When operating a special event station
- C. As part of a multi-operator contest team
- D. When using a club station whose trustee is an Extra Class operator licensee

5 9 T1F13 When must the station licensee make the station and its records available for FCC inspection?

- A. At any time ten days after notification by the FCC of such an inspection
- B. At any time upon request by an FCC representative
- C. Only after failing to comply with an FCC notice of violation
- D. Only when presented with a valid warrant by an FCC official or government agent

5 10 T2A11 Which of the following is an FCC rule regarding power levels used in the amateur bands, under normal, non-distress circumstances?

- A. There is no limit to power as long as there is no interference with other services
- B. No more than 200 watts PEP may be used
- C. Up to 1500 watts PEP may be used on any amateur frequency without restriction
- D. While not exceeding the maximum power permitted on a given band, use the minimum power necessary to carry out the desired communication

5 11 T2B13 Which of the following is true of the use of SSB phone in amateur bands above 50 MHz?

- A. It is permitted only by holders of a General Class or higher license
- B. It is permitted only on repeaters
- C. It is permitted in at least some portion of all the amateur bands above 50 MHz
- D. It is permitted only on when power is limited to no more than 100 watts

5 12 T2C12 What is the Amateur Radio Emergency Service (ARES)?

- A. Licensed amateurs who have voluntarily registered their qualifications and equipment for communications duty in the public service
- B. Licensed amateurs who are members of the military and who voluntarily agreed to provide message handling services in the case of an emergency
- C. A training program that provides licensing courses for those interested in obtaining an amateur license to use during emergencies

D. A training program that certifies amateur operators for membership in the Radio Amateur Civil Emergency Service

5 13 T3A09 Which of the following results from the fact that skip signals refracted from the ionosphere are elliptically polarized?

- A. Digital modes are unusable
- B. Either vertically or horizontally polarized antennas may be used for transmission or reception
- C. FM voice is unusable
- D. Both the transmitting and receiving antennas must be of the same polarization

5 14 T3B11 What is the approximate velocity of a radio wave as it travels through free space?

- A. 3000 kilometers per second
- B. 300,000,000 meters per second
- C. 300,000 miles per hour
- D. 186,000 miles per hour

5 15 T3C12 Which of the following bands may provide long distance communications during the peak of the sunspot cycle?

- A. Six or ten meters
- B. 23 centimeters
- C. 70 centimeters or 1.25 meters
- D. All of these choices are correct

5 16 T4A12 What could be happening if another operator reports a variable high-pitched whine on the audio from your mobile transmitter?

- A. Your microphone is picking up noise from an open window
- B. You have the volume on your receiver set too high
- C. You need to adjust your squelch control
- D. Noise on the vehicle's electrical system is being transmitted along with your speech audio

5 17 T4B12 What is the function of automatic gain control or AGC?

- A. To keep received audio relatively constant
- B. To protect an antenna from lightning
- C. To eliminate RF on the station cabling
- D. An asymmetric goniometer control used for antenna matching

5 18 T5A09 What is the name for a current that reverses direction on a regular basis?

- A. Alternating current
- B. Direct current
- C. Circular current
- D. Vertical current

5 19 T5B12 Which of the following frequencies is equal to 28,400 kHz?

- A. 28.400 MHz
- B. 2.800 MHz
- C. 284.00 MHz
- D. 28.400 kHz

5 20 T5C10 How much power is being used in a circuit when the applied voltage is 12 volts DC and the current is 2.5 amperes?

- A. 4.8 watts B. 30 watts C. 14.5 watts D. 0.208 watts

5 21 T5D12 What is the voltage across a 10-ohm resistor if a current of 2 amperes flows through it?

- A. 8 volts B. 0.2 volts C. 12 volts D. 20 volts

5 22 T6A11 Which of the following battery types is not rechargeable?

- A. Nickel-cadmium B. Carbon-zinc C. Lead-acid D. Lithium-ion

5 23 T6B09 What are the names of the two electrodes of a diode?

- A. Plus and minus B. Source and drain
C. Anode and cathode D. Gate and base

5 24 T6C13 Which of the following is accurately represented in electrical circuit schematic diagrams?

- A. Wire lengths
B. Physical appearance of components
C. The way components are interconnected
D. All of these choices are correct

5 25 T6D12 Which of the following is a common reason to use shielded wire?

- A. To decrease the resistance of DC power connections
B. To increase the current carrying capability of the wire
C. To prevent coupling of unwanted signals to or from the wire
D. To couple the wire to other signals

5 26 T7A08 Which of the following describes combining speech with an RF carrier signal?-

- A. Impedance matching B. Oscillation
C. Modulation D. Low-pass filtering

5 27 T7B08 What should you do if something in a neighbor's home is causing harmful interference to your amateur station?

- A. Work with your neighbor to identify the offending device
B. Politely inform your neighbor about the rules that prohibit the use of devices which cause interference
C. Check your station and make sure it meets the standards of good amateur practice
D. All of these choices are correct

5 28 T7C12 Which of the following is a common use of coaxial cable?

- A. Carrying dc power from a vehicle battery to a mobile radio
B. Carrying RF signals between a radio and antenna

- C. Securing masts, tubing, and other cylindrical objects on towers
- D. Connecting data signals from a TNC to a computer

5 29 T7D09 What is the characteristic appearance of a cold solder joint?

- A. Dark black spots
- B. A bright or shiny surface
- C. A grainy or dull surface
- D. A greenish tint

5 30 T8A11 What is the approximate maximum bandwidth required to transmit a CW signal?

- A. 2.4 kHz
- B. 150 Hz
- C. 1000 Hz
- D. 15 kHz

5 31 T8B10 What do the initials LEO tell you about an amateur satellite?

- A. The satellite battery is in Low Energy Operation mode
- B. The satellite is performing a Lunar Ejection Orbit maneuver
- C. The satellite is in a Low Earth Orbit
- D. The satellite uses Light Emitting Optics

5 32 T8C10 How do you select a specific IRLP node when using a portable transceiver?

- A. Choose a specific CTCSS tone
- B. Choose the correct DSC tone
- C. Access the repeater autopatch
- D. Use the keypad to transmit the IRLP node ID

5 33 T8D09 What code is used when sending CW in the amateur bands?

- A. Baudot
- B. Hamming
- C. International Morse
- D. Gray

5 34 T9A14 Which of the following terms describes a type of loading when referring to an antenna?

- A. Inserting an inductor in the radiating portion of the antenna to make it electrically longer
- B. Inserting a resistor in the radiating portion of the antenna to make it resonant
- C. Installing a spring at the base of the antenna to absorb the effects of collisions with other objects
- D. Making the antenna heavier so it will resist wind effects when in motion

5 35 T9B09 What might cause erratic changes in SWR readings?

- A. The transmitter is being modulated
- B. A loose connection in an antenna or a feed line
- C. The transmitter is being over-modulated
- D. Interference from other stations is distorting your signal

| | | |
|---|----|-----------|
| 5 | 1 | T0A09 (C) |
| 5 | 2 | T0B12 (C) |
| 5 | 3 | T0C13 (C) |
| 5 | 4 | T1A13 (C) |
| 5 | 5 | T1B11 (A) |
| 5 | 6 | T1C13 (D) |
| 5 | 7 | T1D08(B) |
| 5 | 8 | T1E12 (A) |
| 5 | 9 | T1F13 (B) |
| 5 | 10 | T2A11 (D) |
| 5 | 11 | T2B13 (C) |
| 5 | 12 | T2C12 (A) |
| 5 | 13 | T3A09 (B) |
| 5 | 14 | T3B11 (B) |
| 5 | 15 | T3C12 (A) |
| 5 | 16 | T4A12 (D) |
| 5 | 17 | T4B12 (A) |
| 5 | 18 | T5A09 (A) |
| 5 | 19 | T5B12 (A) |
| 5 | 20 | T5C10 (B) |
| 5 | 21 | T5D12 (D) |
| 5 | 22 | T6A11 (B) |
| 5 | 23 | T6B09 (C) |
| 5 | 24 | T6C13 (C) |
| 5 | 25 | T6D12 (C) |
| 5 | 26 | T7A08 (C) |
| 5 | 27 | T7B08 (D) |
| 5 | 28 | T7C12 (B) |
| 5 | 29 | T7D09 (C) |
| 5 | 30 | T8A11 (B) |
| 5 | 31 | T8B10 (C) |
| 5 | 32 | T8C10 (D) |
| 5 | 33 | T8D09 (C) |
| 5 | 34 | T9A14 (A) |
| 5 | 35 | T9B09 (B) |

Frequency Band Chart: <http://www.arrl.org/graphical-frequency-allocations>

For more information, please contact:

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Graphics for 2014-2018 Element 2 Technician Class Exam

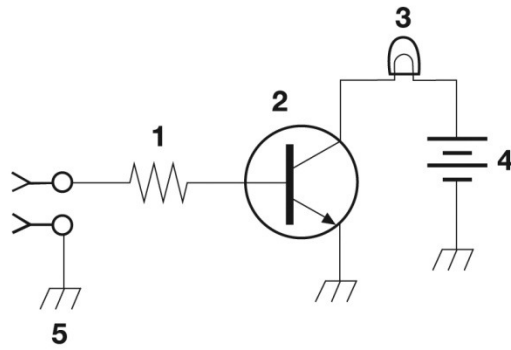


Figure T-1

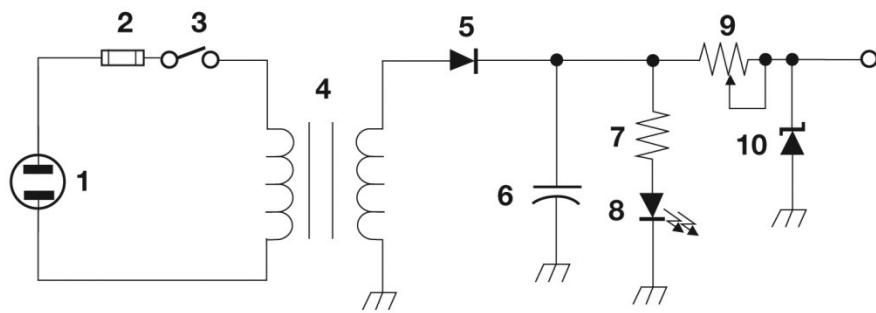


Figure T-2

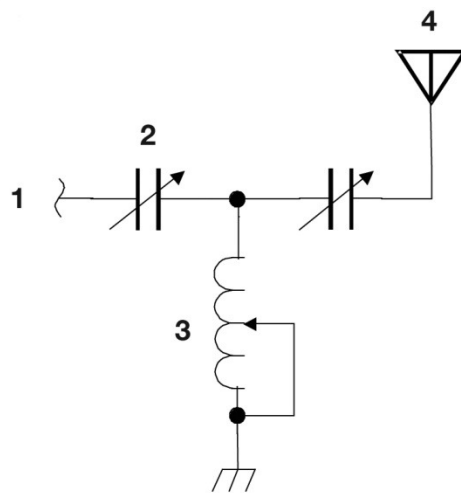


Figure T-3