

Class C Pool of Questions

T2

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

T2

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

T2

3. What is a common repeater frequency offset in the 70 cm band?

T2

4. What is an appropriate way to call another station on a repeater if you know the other station's call sign?

T2

5. How should you respond to a station calling CQ?

T2

6. What must an amateur operator do when making on-air transmissions to test equipment or antennas?

T2

7. Which of the following is true when making a test transmission?

T2

8. What is the meaning of the procedural signal "CQ"?

T2

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

T2

10. What is a band plan, beyond the privileges established by the SMA?

T2

11. Which of the following is an SMA rule regarding power levels used in the amateur bands, under normal, non-distress circumstances?

T2

12. Which of the following is a guideline to use when choosing an operating frequency for calling CQ?

T2B – VHF/UHF operating practices: SSB phone; FM repeater; simplex; splits and shifts; CTCSS; DTMF; tone squelch; carrier squelch; phonetics; operational problem resolution; Q signals

T2

1. What is the term used to describe an amateur station that is transmitting and receiving on the same frequency?

T2

2. 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?

T2

3. Which of the following describes the muting of receiver audio controlled solely by the presence or absence of an RF signal?

T2

4. Which of the following common problems might cause you to be able to hear but not access a repeater even when transmitting with the proper offset?

T2

5. What determines the amount of deviation of an FM (as opposed to PM) signal?

T2

6. What happens when the deviation of an FM transmitter is increased?

T2

7. What could cause your FM signal to interfere with stations on nearby frequencies?

T2

8. Which of the following applies when two stations transmitting on the same frequency interfere with each other?

T2

9. Which of the following methods is encouraged when identifying your station when using phone?

T2

10. Which Q signal indicates that you are receiving interference from other stations?

T2

11. Which Q signal indicates that you are changing frequency?

T2

12. Under what circumstances should you consider communicating via simplex rather than a repeater?

T2

13. Which of the following is true of the use of SSB phone in amateur bands above 50 MHz?

T2C – Public service: emergency and non-emergency operations; applicability of rules; RACES and ARES; net and traffic procedures; emergency restrictions

T2

1. When do the rules NOT apply to the operation of an amateur station?

T2

2. What is one way to recharge a 12-volt lead-acid station battery if the commercial power is out?

T2

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

T2

4. What do RACES and ARES have in common?

T2

5. Which of the following describes the Radio Amateur Civil Emergency Service (RACES)?

T2

6. Which of the following is an accepted practice to get the immediate attention of a net control station when reporting an emergency?

T2

7. Which of the following is an accepted practice for an amateur operator who has checked into an emergency traffic net?

T2

8. Which of the following is a characteristic of good emergency traffic handling?

T2

9. Are amateur station control operators ever permitted to operate outside the frequency privileges of their license class?

T2

10. What is the preamble in a formal traffic message?

T2

11. What is meant by the term “check” in reference to a formal traffic message?

T2

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

SUBELEMENT T3 – Radio wave characteristics: properties of radio waves; propagation modes – [3 Exam Questions - 3 Groups]

T3A - Radio wave characteristics: how a radio signal travels; fading; multipath; wavelength vs. penetration; antenna orientation

T3

1. 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?

T3

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

T3

3. What antenna polarization is normally used for long-distance weak-signal CW and SSB contacts using the VHF and UHF bands?

T3

4. What can happen if the antennas at opposite ends of a VHF or UHF line of sight radio link are not using the same polarization?

T3

5. 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?

T3

6. What term is commonly used to describe the rapid fluttering sound sometimes heard from mobile stations that are moving while transmitting?

T3

7. What type of wave carries radio signals between transmitting and receiving stations?

T3

8. Which of the following is a likely cause of irregular fading of signals received by ionospheric reflection?

T3

9. Which of the following results from the fact that skip signals refracted from the ionosphere are elliptically polarized?

T3

10. What may occur if data signals propagate over multiple paths?

T3

11. Which part of the atmosphere enables the propagation of radio signals around the world?

T3B - Radio and electromagnetic wave properties: the electromagnetic spectrum; wavelength vs. frequency; velocity of electromagnetic waves; calculating wavelength

T3

1. What is the name for the distance a radio wave travels during one complete cycle?

T3

2. What property of a radio wave is used to describe its polarization?

T3

3. What are the two components of a radio wave?

T3

4. How fast does a radio wave travel through free space?

T3

5. How does the wavelength of a radio wave relate to its frequency?

T3

6. What is the formula for converting frequency to approximate wavelength in meters?

T3

7. What property of radio waves is often used to identify the different frequency bands?

T3

8. What are the frequency limits of the VHF spectrum?

T3

9. What are the frequency limits of the UHF spectrum?

T3

10. What frequency range is referred to as HF?

T3

11. What is the approximate velocity of a radio wave as it travels through free space?

T3C - Propagation modes: line of sight; sporadic E; meteor and auroral scatter and reflections; tropospheric ducting; F layer skip; radio horizon

T3

1. Why are direct (not via a repeater) UHF signals rarely heard from stations outside your local coverage area?

T3

2. Which of the following might be happening when VHF signals are being received from long distances?

T3

3. What is a characteristic of VHF signals received via auroral reflection?

T3

4. Which of the following propagation types is most commonly associated with occasional strong over-the-horizon signals on the 10, 6, and 2 meter bands?

T3

5. Which of the following effects might cause radio signals to be heard despite obstructions between the transmitting and receiving stations?

T3

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

T3

7. What band is best suited for communicating via meteor scatter?

T3

8. What causes tropospheric ducting?

T3

9. What is generally the best time for long-distance 10 meter band propagation via the F layer?

T3

10. What is the radio horizon?

T3

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

T3

12. Which of the following bands may provide long distance communications during the peak of the sunspot cycle?

[SUBELEMENT T4 - Amateur radio practices and station set up – \[2 Exam Questions - 2 Groups\]](#)

[T4A – Station setup: connecting microphones; reducing unwanted emissions; power source; connecting a computer; RF grounding; connecting digital equipment; connecting an SWR meter](#)

T4

1. Which of the following is true concerning the microphone connectors on amateur transceivers?

T4

2. How might a computer be used as part of an amateur radio station?

T4

3. Which is a good reason to use a regulated power supply for communications equipment?

T4

4. Where must a filter be installed to reduce harmonic emissions from your station?

T4

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

T4

6. Which of the following would be connected between a transceiver and computer in a packet radio station?

T4

7. How is a computer's sound card used when conducting digital communications using a computer?

T4

8. Which type of conductor is best to use for RF grounding?

T4

9. Which of the following could you use to cure distorted audio caused by RF current flowing on the shield of a microphone cable?

T4

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

T4

11. Where should the negative return connection of a mobile transceiver's power cable be connected?

T4

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

T4B - Operating controls: tuning; use of filters; squelch function; AGC; repeater offset; memory channels

T4

1. What may happen if a transmitter is operated with the microphone gain set too high?

T4

2. Which of the following can be used to enter the operating frequency on a modern transceiver?

T4

3. What is the purpose of the squelch control on a transceiver?

T4

4. What is a way to enable quick access to a favorite frequency on your transceiver?

T4

5. Which of the following would reduce ignition interference to a receiver?

T4

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

T4

7. What does the term "RIT" mean?

T4

8. What is the advantage of having multiple receive bandwidth choices on a multimode transceiver?

T4

9. Which of the following is an appropriate receive filter bandwidth to select in order to minimize noise and interference for SSB reception?

T4

10. Which of the following is an appropriate receive filter bandwidth to select in order to minimize noise and interference for CW reception?

T4

11. Which of the following describes the common meaning of the term "repeater offset"?

T4

12. What is the function of automatic gain control or AGC?

SUBELEMENT T5 – Electrical principles: math for electronics; electronic principles; Ohm’s Law – [4 Exam Questions - 4 Groups]

T5A - Electrical principles, units, and terms: current and voltage; conductors and insulators; alternating and direct current

T5

1. Electrical current is measured in which of the following units?

T5

2. Electrical power is measured in which of the following units?

T5

3. What is the name for the flow of electrons in an electric circuit?

T5

4. What is the name for a current that flows only in one direction?

T5

5. What is the electrical term for the electromotive force (EMF) that causes electron flow?

T5

6. How much voltage does a mobile transceiver usually require?

T5

7. Which of the following is a good electrical conductor?

T5

8. Which of the following is a good electrical insulator?

T5

9. What is the name for a current that reverses direction on a regular basis?

T5

10. Which term describes the rate at which electrical energy is used?

T5

11. What is the basic unit of electromotive force?

T5

12. What term describes the number of times per second that an alternating current reverses direction?

T5B - Math for electronics: conversion of electrical units; decibels; the metric system

T5

1. How many milliamperes is 1.5 amperes?

T5

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

T5

3. How many volts are equal to one kilovolt?

T5

4. How many volts are equal to one microvolt?

T5

5. Which of the following is equivalent to 500 milliwatts?

T5

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

T5

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

T5

8. How many microfarads are 1,000,000 picofarads?

T5

9. What is the approximate amount of change, measured in decibels (dB), of a power increase from 5 watts to 10 watts?

T5

10. What is the approximate amount of change, measured in decibels (dB), of a power decrease from 12 watts to 3 watts?

T5

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

T5

12. Which of the following frequencies is equal to 28,400 kHz?

T5

13. If a frequency readout shows a reading of 2425 MHz, what frequency is that in GHz?

T5C - Electronic principles: capacitance; inductance; current flow in circuits; alternating current; definition of RF; DC power calculations; impedance

T5

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

T5

2. What is the basic unit of capacitance?

T5

3. What is the ability to store energy in a magnetic field called?

T5

4. What is the basic unit of inductance?

T5

5. What is the unit of frequency?

T5

6. What does the abbreviation "RF" refer to?

T5

7. What is a usual name for electromagnetic waves that travel through space?

T5

8. What is the formula used to calculate electrical power in a DC circuit?

T5

9. How much power is being used in a circuit when the applied voltage is 13.8 volts DC and the current is 10 amperes?

T5

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

T5

11. How many amperes are flowing in a circuit when the applied voltage is 12 volts DC and the load is 120 watts?

T5

12. What is meant by the term impedance?

T5

13. What are the units of impedance?

T5D – Ohm's Law: formulas and usage

T5

1. What formula is used to calculate current in a circuit?

T5

2. What formula is used to calculate voltage in a circuit?

T5

3. What formula is used to calculate resistance in a circuit?

T5

4. What is the resistance of a circuit in which a current of 3 amperes flows through a resistor connected to 90 volts?

T5

5. What is the resistance in a circuit for which the applied voltage is 12 volts and the current flow is 1.5 amperes?

T5

6. What is the resistance of a circuit that draws 4 amperes from a 12-volt source?

T5

7. What is the current flow in a circuit with an applied voltage of 120 volts and a resistance of 80 ohms?

T5

8. What is the current flowing through a 100-ohm resistor connected across 200 volts?

T5

9. What is the current flowing through a 24-ohm resistor connected across 240 volts?

T5

10. What is the voltage across a 2-ohm resistor if a current of 0.5 amperes flows through it?

T5

11. What is the voltage across a 10-ohm resistor if a current of 1 ampere flows through it?

T5

12. What is the voltage across a 10-ohm resistor if a current of 2 amperes flows through it?

SUBELEMENT T6 – Electrical components: semiconductors; circuit diagrams; component functions – [4 Exam Questions - 4 Groups]

T6A - Electrical components: fixed and variable resistors; capacitors and inductors; fuses; switches; batteries

T6

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

T6

2. What type of component is often used as an adjustable volume control?

T6

3. What electrical parameter is controlled by a potentiometer?

T6

4. What electrical component stores energy in an electric field?

T6

5. What type of electrical component consists of two or more conductive surfaces separated by an insulator?

T6

6. What type of electrical component stores energy in a magnetic field?

T6

7. What electrical component is usually composed of a coil of wire?

T6

8. What electrical component is used to connect or disconnect electrical circuits?

T6

9. What electrical component is used to protect other circuit components from current overloads?

T6

10. Which of the following battery types is rechargeable?

T6

11. Which of the following battery types is not rechargeable?

T6B – Semiconductors: basic principles and applications of solid state devices; diodes and transistors

T6

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

T6

2. What electronic component allows current to flow in only one direction?

T6

3. Which of these components can be used as an electronic switch or amplifier?

T6

4. Which of the following components can be made of three layers of semiconductor material?

T6

5. Which of the following electronic components can amplify signals?

T6

6. How is the cathode lead of a semiconductor diode usually identified?

T6

7. What does the abbreviation LED stand for?

T6

8. What does the abbreviation FET stand for?

T6

9. What are the names of the two electrodes of a diode?

T6

10. What are the three electrodes of a PNP or NPN transistor?

T6

11. What are the three electrodes of a field effect transistor?

T6

12. What is the term that describes a transistor's ability to amplify a signal?

T6C - Circuit diagrams; schematic symbols

T6

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

T6

2. What is component 1 in figure T1?

T6

3. What is component 2 in figure T1?

T6

4. What is component 3 in figure T1?

T6

5. What is component 4 in figure T1?

T6

6. What is component 6 in figure T2?

T6

7. What is component 8 in figure T2?

T6

8. What is component 9 in figure T2?

T6

9. What is component 4 in figure T2?

T6

10. What is component 3 in figure T3?

T6

11. What is component 4 in figure T3?

T6

12. What do the symbols on an electrical circuit schematic diagram represent?

T6

13. Which of the following is accurately represented in electrical circuit schematic diagrams?

T6D - Component functions: rectification; switches; indicators; power supply components; resonant circuit; shielding; power transformers; integrated circuits

T6

1. Which of the following devices or circuits changes an alternating current into a varying direct current signal?

T6

2. What best describes a relay?

T6

3. What type of switch is represented by component 3 in figure T2?

T6

4. Which of the following can be used to display signal strength on a numeric scale?

T6

5. What type of circuit controls the amount of voltage from a power supply?

T6

6. What component is commonly used to change 120V AC house current to a lower AC voltage for other uses?

T6

7. Which of the following is commonly used as a visual indicator?

T6

8. Which of the following is used together with an inductor to make a tuned circuit?

T6

9. What is the name of a device that combines several semiconductors and other components into one package?

T6

10. What is the function of component 2 in Figure T1?

T6

11. What is a simple resonant or tuned circuit?

T6

12. Which of the following is a common reason to use shielded wire?

SUBELEMENT T7 – Station equipment: common transmitter and receiver problems; antenna measurements; troubleshooting; basic repair and testing – [4 Exam Questions - 4 Groups]

T7A – Station equipment: receivers; transmitters; transceivers; modulation; transverters; low power and weak signal operation; transmit and receive amplifiers

T7

1. Which term describes the ability of a receiver to detect the presence of a signal?

T7

2. What is a transceiver?

T7

3. Which of the following is used to convert a radio signal from one frequency to another?

T7

4. Which term describes the ability of a receiver to discriminate between multiple signals?

T7

5. What is the name of a circuit that generates a signal of a desired frequency?

T7

6. What device takes the output of a low-powered 28 MHz SSB exciter and produces a 222

T7

7. What is meant by term “PTT”?

T7

8. Which of the following describes combining speech with an RF carrier signal?-

T7

9. Which of the following devices is most useful for VHF weak-signal communication?

T7

10. What device increases the low-power output from a handheld transceiver?

T7

11. Where is an RF preamplifier installed?

T7B – Common transmitter and receiver problems: symptoms of overload and overdrive; distortion; causes of interference; interference and consumer electronics; part 15 devices; over and under modulation; RF feedback; off frequency signals; fading and noise; problems with digital communications interfaces

T7

1. What can you do if you are told your FM handheld or mobile transceiver is over-deviating?

T7

2. What would cause a broadcast AM or FM radio to receive an amateur radio transmission unintentionally?

T7

3. Which of the following may be a cause of radio frequency interference?

T7

4. Which of the following is a way to reduce or eliminate interference by an amateur transmitter to a nearby telephone?

T7

5. How can overload of a non-amateur radio or TV receiver by an amateur signal be reduced or eliminated?

T7

6. 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?

T7

7. Which of the following may be useful in correcting a radio frequency interference problem?

T7

8. What should you do if something in a neighbor’s home is causing harmful interference to your amateur station?

T7

9. What is a Part 15 device?

T7

10. What might be the problem if you receive a report that your audio signal through the repeater is distorted or unintelligible?

T7

11. What is a symptom of RF feedback in a transmitter or transceiver?

T7

12. What might be the first step to resolve cable TV interference from your ham radio transmission?

T7

1. What is the primary purpose of a dummy load?

T7

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

T7

3. What, in general terms, is standing wave ratio (SWR)?

T7

4. What reading on an SWR meter indicates a perfect impedance match between the antenna and the feed line?

T7

5. What is the approximate SWR value above which the protection circuits in most solid-state transmitters begin to reduce transmitter power?

T7

6. What does an SWR reading of 4:1 indicate?

T7

7. What happens to power lost in a feed line?

T7

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

T7

9. Which of the following is the most common cause for failure of coaxial cables?

T7

10. Why should the outer jacket of coaxial cable be resistant to ultraviolet light?

T7

11. What is a disadvantage of air core coaxial cable when compared to foam or solid dielectric types?

T7

12. Which of the following is a common use of coaxial cable?

T7

13. What does a dummy load consist of?

T7D – Basic repair and testing: soldering; using basic test instruments; connecting a voltmeter, ammeter, or ohmmeter

T7

1. Which instrument would you use to measure electric potential or electromotive force?

T7

2. What is the correct way to connect a voltmeter to a circuit?

T7

3. How is an ammeter usually connected to a circuit?

T7

4. Which instrument is used to measure electric current?

T7

5. What instrument is used to measure resistance?

T7

6. Which of the following might damage a multimeter?

T7

7. Which of the following measurements are commonly made using a multimeter?

T7

8. Which of the following types of solder is best for radio and electronic use?

T7

9. What is the characteristic appearance of a cold solder joint?

T7

10. What is probably happening when an ohmmeter, connected across an unpowered circuit, initially indicates a low resistance and then shows increasing resistance with time?

T7

11. Which of the following precautions should be taken when measuring circuit resistance with an ohmmeter?

T7

12. Which of the following precautions should be taken when measuring high voltages with a voltmeter?

SUBELEMENT T8 – Modulation modes: amateur satellite operation; operating activities; non-voice communications – [4 Exam Questions - 4 Groups]

T8A – Modulation modes: bandwidth of various signals; choice of emission type

T8

1. Which of the following is a form of amplitude modulation?

T8

2. What type of modulation is most commonly used for VHF packet radio transmissions?

T8

3. Which type of voice mode is most often used for long-distance (weak signal) contacts on the VHF and UHF bands?

T8

4. Which type of modulation is most commonly used for VHF and UHF voice repeaters?

T8

5. Which of the following types of emission has the narrowest bandwidth?

T8

6. Which sideband is normally used for 10 meter HF, VHF and UHF single-sideband communications?

T8

7. What is the primary advantage of single sideband over FM for voice transmissions?

T8

8. What is the approximate bandwidth of a single sideband voice signal?

T8

9. What is the approximate bandwidth of a VHF repeater FM phone signal?

10. What is the typical bandwidth of analog fast-scan TV transmissions on the 70 cm band?

T8

11. What is the approximate maximum bandwidth required to transmit a CW signal?

T8B - Amateur satellite operation; Doppler shift, basic orbits, operating protocols; control operator, transmitter power considerations; satellite tracking; digital modes

T8

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

T8

2. How much transmitter power should be used on the uplink frequency of an amateur satellite or space station?

T8

3. Which of the following are provided by satellite tracking programs?

T8

4. 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?

T8

5. What is a satellite beacon?

T8

6. Which of the following are inputs to a satellite tracking program?

T8

7. With regard to satellite communications, what is Doppler shift?

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6. Which of the following are inputs to a satellite tracking program?

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7. With regard to satellite communications, what is Doppler shift?

T8

8. What is meant by the statement that a satellite is operating in mode U/V?

T8

9. What causes spin fading when referring to satellite signals?

T8

10. What do the initials LEO tell you about an amateur satellite?

T8

11. What is a commonly used method of sending signals to and from a digital satellite?

T8C – Operating activities: radio direction finding; radio control; contests; linking over the Internet; grid locators

T8

- 1. Which of the following methods is used to locate sources of noise interference or jamming?**
T8
- 2. Which of these items would be useful for a hidden transmitter hunt?**
T8
- 3. What popular operating activity involves contacting as many stations as possible during a specified period of time?**
T8
- 4. Which of the following is good procedure when contacting another station in a radio contest?**
T8
- 5. What is a grid locator?**
T8
- 6. How is access to an IRLP node accomplished?**
T8
- 7. What is the maximum power allowed when transmitting telecommand signals to radio controlled models?**
T8
- 8. What is required in place of on-air station identification when sending signals to a radio control model using amateur frequencies?**
T8
- 9. How might you obtain a list of active nodes that use VoIP?**
T8
- 10. How do you select a specific IRLP node when using a portable transceiver?**
T8
- 11. What name is given to an amateur radio station that is used to connect other amateur stations to the Internet?**
T8
- 12. What is meant by Voice Over Internet Protocol (VoIP) as used in amateur radio?**
T8
- 13. What is the Internet Radio Linking Project (IRLP)?**

T8D – Non-voice communications: image signals; digital modes; CW; packet; PSK31; APRS; error detection and correction; NTSC

T8

- 1. Which of the following is an example of a digital communications method?**
T8
- 2. What does the term “APRS” mean?**
T8
- 3. Which of the following devices provides data to the transmitter when sending automatic position reports from a mobile amateur radio station?**
T8
- 4. What type of transmission is indicated by the term NTSC?**
T8

5. Which of the following is an application of APRS (Automatic Packet Reporting System)?

T8

6. What does the abbreviation PSK mean?

T8

7. What is PSK31?

T8

8. Which of the following may be included in packet transmissions?

T8

9. What code is used when sending CW in the amateur bands?

T8

10. Which of the following can be used to transmit CW in the amateur bands?

T8

11. What is an ARQ transmission system?

[SUBELEMENT T9 – Antennas and feed lines - \[2 Exam Questions - 2 Groups\]](#)

[T9A – Antennas: vertical and horizontal polarization; concept of gain; common portable and mobile antennas; relationships between antenna length and frequency](#)

T9

1. What is a beam antenna?

T9

2. Which of the following is true regarding vertical antennas?

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8. What is meant by the statement that a satellite is operating in mode U/V?

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9. What causes spin fading when referring to satellite signals?

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T8D – Non-voice communications: image signals; digital modes; CW; packet; PSK31; APRS; error detection and correction; NTSC

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SUBELEMENT T9 – Antennas and feed lines - [2 Exam Questions - 2 Groups]

T9A – Antennas: vertical and horizontal polarization; concept of gain; common portable and mobile antennas; relationships between antenna length and frequency

T9

1. What is a beam antenna?

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2. Which of the following is true regarding vertical antennas?

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3. Which of the following describes a simple dipole mounted so the conductor is parallel to the Earth's surface?

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4. What is a disadvantage of the “rubber duck” antenna supplied with most handheld radio transceivers?

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5. How would you change a dipole antenna to make it resonant on a higher frequency?

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6. What type of antennas are the quad, Yagi, and dish?

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7. What is a good reason not to use a “rubber duck” antenna inside your car?

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8. What is the approximate length, in inches, of a quarter-wavelength vertical antenna for 146 MHz?

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9. What is the approximate length, in inches, of a 6 meter 1/2-wavelength wire dipole antenna?

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10. In which direction is the radiation strongest from a half-wave dipole antenna in free space?

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11. What is meant by the gain of an antenna?

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12. What is a reason to use a properly mounted 5/8 wavelength antenna for VHF or UHF mobile service?

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13. Why are VHF or UHF mobile antennas often mounted in the center of the vehicle roof?

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8. What is meant by the statement that a satellite is operating in mode U/V?

T8

9. What causes spin fading when referring to satellite signals?

T8

10. What do the initials LEO tell you about an amateur satellite?

T8

11. What is a commonly used method of sending signals to and from a digital satellite?

T8C – Operating activities: radio direction finding; radio control; contests; linking over the Internet; grid locators

T8

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

T8

2. Which of these items would be useful for a hidden transmitter hunt?

T8

3. What popular operating activity involves contacting as many stations as possible during a specified period of time?

T8

4. Which of the following is good procedure when contacting another station in a radio contest?

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T9B – Feed lines: types of feed lines; attenuation vs. frequency; SWR concepts; matching; weather protection; choosing RF connectors and feed lines

T9

1. Why is it important to have a low SWR in an antenna system that uses coaxial cable feed line?

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2. What is the impedance of the most commonly used coaxial cable in typical amateur radio installations?

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3. Why is coaxial cable used more often than any other feed line for amateur radio antenna systems?

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4. What does an antenna tuner do?

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5. What generally happens as the frequency of a signal passing through coaxial cable is increased?

T9

6. Which of the following connectors is most suitable for frequencies above 400 MHz?

T9

7. Which of the following is true of PL-259 type coax connectors?

T9

8. Why should coax connectors exposed to the weather be sealed against water intrusion?

T9

9. What might cause erratic changes in SWR readings?

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SUBELEMENT T0 – Electrical safety: AC and DC power circuits; antenna installation; RF hazards – [3 Exam Questions - 3 Groups]

T0A – Power circuits and hazards: hazardous voltages; fuses and circuit breakers; grounding; lightning protection; battery safety; electrical code compliance

T0

1. Which of the following is a safety hazard of a 12-volt storage battery?

T0

2. How does current flowing through the body cause a health hazard?

T0

3. What is connected to the green wire in a three-wire electrical AC plug?

T0

4. What is the purpose of a fuse in an electrical circuit?

T0

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

T0

6. What is a good way to guard against electrical shock at your station?

T0

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

T0

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

T0

9. What kind of hazard is presented by a conventional 12-volt storage battery?

T0

10. What can happen if a lead-acid storage battery is charged or discharged too quickly?

T0

11. What kind of hazard might exist in a power supply when it is turned off and disconnected?

T0B – Antenna safety: tower safety; erecting an antenna support; overhead power lines; installing an antenna

T0

1. When should members of a tower work team wear a hard hat and safety glasses?

T0

2. What is a good precaution to observe before climbing an antenna tower?

T0

3. Under what circumstances is it safe to climb a tower without a helper or observer?

T0

4. Which of the following is an important safety precaution to observe when putting up an antenna tower?

T0

5. What is the purpose of a gin pole?

T0

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

T0

7. Which of the following is an important safety rule to remember when using a crank-up tower?

T0

8. What is considered to be a proper grounding method for a tower?

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11. What kind of hazard might exist in a power supply when it is turned off and disconnected?

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8. What is considered to be a proper grounding method for a tower?

T0

9. Why should you avoid attaching an antenna to a utility pole?

T0

10. Which of the following is true concerning grounding conductors used for lightning protection?

T0

11. Which of the following establishes grounding requirements for an amateur radio tower or antenna?

T0

12. Which of the following is good practice when installing ground wires on a tower for lightning protection?

T0C - RF hazards: radiation exposure; proximity to antennas; recognized safe power levels; exposure to others; radiation types; duty cycle

T0

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

T0

2. Which of the following frequencies has the lowest value for Maximum Permissible Exposure limit?

T0

3. What is the maximum power level that an amateur radio station may use at VHF frequencies before an RF exposure evaluation is required?

T0

4. What factors affect the RF exposure of people near an amateur station antenna?

T0

5. Why do exposure limits vary with frequency?

T0

6. What could happen if a person accidentally touched your antenna while you were transmitting?

T0

7. Which of the following actions might amateur operators take to prevent exposure to RF radiation in excess of supplied limits?

T0

8. How can you make sure your station stays in compliance with RF safety regulations?

T0

9. Why is duty cycle one of the factors used to determine safe RF radiation exposure levels?

T0

10. What is the definition of duty cycle during the averaging time for RF exposure?

T0

11. How does RF radiation differ from ionizing radiation (radioactivity)?

T0

12. 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?