

Technician Class Amateur Radio Exam Sections
Effective 07-01-14
TOTAL QUESTIONS 426

SUBELEMENT T1 - FCC Rules, descriptions and definitions for the Amateur Radio Service, operator and station license responsibilities - [6 Exam Questions - 6 Groups]

T1A - Amateur Radio Service: purpose and permissible use of the Amateur Radio Service; operator/primary station license grant; where FCC rules are codified; basis and purpose of FCC rules; meanings of basic terms used in FCC rules; interference; spectrum management

T1B - Authorized frequencies: frequency allocations; ITU regions; emission modes; restricted sub-bands; spectrum sharing; transmissions near band edges

T1C - Operator licensing: operator classes; sequential, special event, and vanity call sign systems; international communications; reciprocal operation; station license and licensee; places where the amateur service is regulated by the FCC; name and address on FCC license database; license term; renewal; grace period

T1D - Authorized and prohibited transmission: communications with other countries; music; exchange of information with other services; indecent language; compensation for use of station; retransmission of other amateur signals; codes and ciphers; sale of equipment; unidentified transmissions; broadcasting

T1E - Control operator and control types: control operator required; eligibility; designation of control operator; privileges and duties; control point; local, automatic and remote control; location of control operator

T1F - Station identification; repeaters; third party communications; club stations; FCC inspection

SUBELEMENT T2 - Operating Procedures [3 Exam Questions - 3 Groups]

T2A - Station operation: choosing an operating frequency; calling another station; test transmissions; procedural signs; use of minimum power; choosing an operating frequency; band plans; calling frequencies; repeater offsets

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

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

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

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

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

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

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

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

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

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

T5D - Ohm's Law: formulas and usage

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

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

T6C - Circuit diagrams; schematic symbols

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

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

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

SUBELEMENT T7 cont.

T7C - Antenna measurements and troubleshooting: measuring SWR; dummy loads; coaxial cables; feed line failure modes

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

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

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

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

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

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

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

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

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

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