

Technician (2018-2022) License Exam Syllabus

The Technician (2018-2022) license exam question pool contains

- 423 questions
- Divided into 10 SUPPLEMENTS (T0 - T9) that are subdivided into 35 topics.

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

T1A

1. Amateur Radio Service: purpose and permissible use of the Amateur Radio Service, operator/primary station license grant;
2. Meanings of basic terms used in FCC rules;
3. Interference;
4. RACES rules; Phonetics; Frequency Coordinator

T1B

1. Authorized frequencies:
 1. frequency allocations;
 2. ITU;
 3. emission modes;
 4. restricted sub-bands;
 5. spectrum sharing;
 6. transmissions near band edges;
 7. contacting the International Space Station;
 8. power output

T1C

1. Operator licensing:
 1. operator classes;
 2. sequential and vanity call sign systems;
 3. international communications;
 4. reciprocal operation;
 5. places where the Amateur Radio Service is regulated by the FCC;
 6. name and address on FCC license database;
 7. license term;
 8. renewal;
 9. grace period

T1D

1. Authorized and prohibited transmission:
 1. communications with other countries;
 2. music;
 3. exchange of information with other services;
 4. indecent language;
 5. compensation for use of station;
 6. retransmission of other amateur signals;
 7. codes and ciphers;
 8. sale of equipment;
 9. unidentified transmissions;
 10. one-way transmission

T1E

1. Control operator and control types:
 1. control operator required;
 2. eligibility;
 3. designation of control operator;
 4. privileges and duties;
 5. control point;
 6. local, automatic and remote control;
 7. location of control operator

T1F

1. Station identification;
2. repeaters;
3. third-party communications;
4. club stations;
5. FCC inspection

SUPPLEMENT T2 - Operating Procedures - [3 Exam Questions - 3 Topics]

T2A

1. Station operation:
 1. choosing an operating frequency;
 2. calling another station;
 3. test transmissions;
 4. procedural signs;
 5. use of minimum power;
 6. choosing an operating frequency;
 7. band plans;
 8. calling frequencies;
 9. repeater offsets

T2B

1. VHF/UHF operating practices:
 1. SSB phone;
 2. FM repeater;
 3. simplex;
 4. splits and shifts;
 5. CTCSS; DTMF;
 6. tone squelch;
 7. carrier squelch;
 8. phonetics;
 9. operational problem resolution;
 10. Q signals

T2C

1. Public service:
 1. emergency and non-emergency operations;
 2. applicability of FCC rules;
 3. RACES and ARES;
 4. net and traffic procedures;
 5. emergency restrictions

SUPPLEMENT T3 - Radio wave characteristics: properties of radio waves; propagation modes - [3 Exam Questions - 3 Topics]

T3A

1. Radio wave characteristics:
 1. how a radio signal travels;
 2. fading; multipath;
 3. polarization;
 4. wavelength vs absorption;
 5. antenna orientation

T3B

1. Radio and electromagnetic wave properties:
 1. the electromagnetic spectrum;
 2. wavelength vs frequency;
 3. nature and velocity of electromagnetic waves;
 4. definition of UHF, VHF, HF bands;
 5. calculating wavelength

T3C

1. Propagation modes:
 1. line of sight;
 2. sporadic E;
 3. meteor and auroral scatter and reflections;
 4. tropospheric ducting;
 5. F layer skip; radio horizon

SUPPLEMENT T4 - Amateur radio practices and station set-up - [2 Exam Questions - 2 Topics]

T4A

1. Station setup:
 1. connecting microphones;
 2. reducing unwanted emissions;
 3. power source;
 4. connecting a computer;
 5. RF grounding;
 6. connecting digital equipment;
 7. connecting an SWR meter

T4B

1. Operating controls:
 1. tuning; use of filters;
 2. squelch function;
 3. AGC;
 4. transceiver operation;
 5. memory channels

SUPPLEMENT T5 - Electrical principles: math for electronics; electronic principles; Ohm's Law - [4 Exam Questions - 4 Topics]

T5A

1. Electrical principles, units, and terms:
 1. current and voltage;
 2. conductors and insulators;
 3. alternating and direct current;
 4. series and parallel circuits

T5B

1. Math Math for electronics:
 1. conversion of electrical units;
 2. decibels;
 3. the metric system

T5C

1. Electronic principles:
 1. capacitance;
 2. inductance;
 3. current flow in circuits;
 4. alternating current;
 5. definition of RF;
 6. definition of polarity;
 7. DC power calculations; impedance

T5D

1. Ohm's Law:
 1. formulas and usage;
 2. components in series and parallel

SUPPLEMENT T6 - Electrical components; circuit diagrams; component functions - [4 Exam Questions - 4 Topics]**T6A**

1. Electrical components:
 1. fixed and variable resistors;
 2. capacitors and inductors;
 3. fuses;
 4. switches;
 5. batteries

T6B

1. Semiconductors:
 1. basic principles and applications of solid state devices;
 2. diodes and transistors

T6C

1. Circuit diagrams;
2. schematic symbols

T6D

1. Component functions:
 1. rectification;
 2. switches;
 3. indicators;
 4. power supply components; resonant circuit;
 5. shielding;
 6. power transformers;
 7. integrated circuits

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

T7A

1. Station equipment: receivers;
 1. transmitters;
 2. transceivers;
 3. modulation;
 4. transverters;
 5. transmit and receive amplifiers

T7B

1. Common transmitter and receiver problems;
2. symptoms of overload and overdrive;
3. distortion;
4. causes of interference;
5. interference and consumer electronics;
6. part 15 devices;
7. over-modulation;
8. RF feedback;
9. off frequency signals

T7C

1. Antenna measurements and troubleshooting:
 1. measuring SWR;
 2. dummy loads;
 3. coaxial cables;
 4. causes of feed line failures

T7D

1. Basic repair and testing:
 1. soldering;
 2. using basic test instruments;
 3. connecting a voltmeter,
 4. ammeter,
 5. or ohmmeter

SUPPLEMENT T8 - Modulation modes: amateur satellite operation; operating activities; non-voice and digital communications - [4 Exam Questions - 4 Topics]

T8A -

1. Modulation modes:
 1. bandwidth of various signals;
 2. choice of emission type

T8B

1. Amateur satellite operation;
 1. Doppler shift;
 2. basic orbits;
 3. operating protocols;
 4. transmitter power considerations;
 5. telemetry and telecommand;
 6. satellite tracking

T8C

1. Operating activities;
2. radio direction finding;
3. radio control;
4. contests;
5. linking over the internet;
6. grid locators

T8D

1. Non-voice and digital communications:
 1. image signals;
 2. digital modes;
 3. CW;
 4. packet radio;
 5. PSK31;
 6. APRS;
 7. error detection and correction;
 8. NTSC; amateur radio networking;
 9. Digital Mobile/Migration Radio

SUPPLEMENT T9 - Antennas and feed lines - [2 Exam Questions - 2 Topics]

T9A

1. Antennas:
 1. vertical and horizontal polarization;
 2. concept of gain;
 3. common portable and mobile antennas;
 4. relationships between resonant length and frequency;
 5. concept of dipole antennas

T9B

1. Feed lines:
 1. types, attenuation vs frequency, selecting;
 2. SWR concepts;
 3. Antenna tuners (couplers);
 4. RF Connectors: selecting, weather protection

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

T0A

1. Power circuits and hazards:
 1. hazardous voltages;
 2. fuses and circuit breakers;
 3. grounding;
 4. lightning protection;
 5. battery safety;
 6. electrical code compliance

T0B

1. Antenna safety:
 1. tower safety and grounding;
 2. erecting an antenna support;
 3. safely installing an antenna
 - 4.

T0C

1. RF hazards:
 1. radiation exposure;
 2. proximity to antennas;
 3. recognized safe power levels;
 4. exposure to others;
 5. radiation types;
 6. duty cycle