

Amateur Radio Operator License Test

Syllabus

1. Regulatory Matters

The regulatory environment, The amateur radio license, who issues them, payment of fees
Call signs, Power permitted, Emergency operation, Ciphers and secret codes.

2. Frequencies

Frequencies and bands allocated for amateur radio operating, Sharing of bands.

3. Electronics Fundamentals

Insulators, conductors and semiconductors, Fields produced by currents and magnets.
Units of voltage, current, resistance, impedance, Types of cells.

4. Measurement Units

Units of voltage, current, resistance, impedance, power.

5. Ohm's Law

Calculations involving voltage, current, resistance (using a single resistor).

6. Resistance

Values of resistors in series and parallel (using two resistors and more). Calculations
involving resistor combinations, voltage, current, Internal resistance of cells.

7. Capacitors, Inductors, Resonance

Variation of capacitance with plate size, spacing, Dielectrics, Variation of inductance with
diameter, length, number of turns (descriptive only), C and L in series and parallel,
Impedance Transformers, turns ratios, voltage transformation.

8. Safety

Basic procedures for removing persons from live circuits, Action of a RCD (residual current
device), fuse, Isolating transformer, Grounding, Color codes and names of mains wiring.

9. Semiconductors

Basic properties of semiconductor materials, Basic properties of diodes, Zener diodes,
transistors. Recognition of electrode names of bi-polar transistors, FETs, valves.

10. Meters and Measuring

The basic function of voltmeters, ammeters, SWR bridges, power meters, the impedances
they present to circuits, how they should be connected, Peak and RMS values.

11. Decibels, Amplification and Attenuation

Power, voltage and current ratios expressed in dB, Gain in dB of systems connected in cascade.

12. An Amateur Radio Station

HF Station Arrangement, Understanding the block diagram of a typical HF station, showing how a transceiver is connected to a linear amplifier, low pass filter, SWR bridge, antenna switch, antenna tuner, dummy load and antenna, The basic function of each block, Meaning of "SSB", "CW", "FM".

13. Power supplies

Cells. Mains input DC power supplies, Purpose of diodes, capacitors, transformers, Fullwave and halfwave rectification, ripple frequencies.

14. General Operating Procedures

Standard calling, answering, conversing procedures and conventions, Initiating and terminating contacts, Callsign exchanges.

15. Q signals

Common Q signals used in Amateur Radio communications.

16. Antennas

Lengths of dipoles, verticals, for different frequencies, Impedances, Feed point position Matching, Antenna bandwidth, Elements of a yagi antenna, direction of radiation, E and H fields around antennas, Polarization, Tuning antennas with inductance, Balloons, Dummy antenna. Isotropic antenna.

17. Propagation

Basic phenomena in HF, VHF, UHF propagation, Layers which refract signals, D layer absorption, Skip zones, hops, MUF, LUF, OMF, Solar cycle, Sky waves, ground waves. Sporadic E, Great circle paths, radiation angles, Fading, Doppler caused by satellite motion.

18. Interference & filtering

Causes and recognition of cross modulation, Unwanted harmonics, Definitions of low-pass, band-pass, band-reject, notch and high-pass filters, Using filters for interference reduction.