

Basic Radio Exam Topics

Source - RIC-3: Information on the Amateur Radio Service

2.1 Basic Qualification Examination

An examination of 100 questions is made by drawing one question from a series of questions applicable to the following 100 topic areas. The pass mark is 70%. A score of 80% or above will grant the individual additional privileges commensurate with a Basic with Honours Qualification.

Major Divisions

1. Regulations and Policies - 25 Topics
2. Operating and Procedures - 9 Topics
3. Station Assembly, Practice and Safety - 21 topics
4. Circuit Components - 6 topics
5. Basic Electronics and Theory - 13 topics
6. Feedlines and Antenna Systems - 13 topics
7. Radio Wave Propagation - 8 topics
8. Interference and Suppression - 5 topics

Regulations and Policies - 001

1-1 radio licences, applicability, eligibility of licence holder

1-2 licence fee, term, posting requirements, change of address

1-3 licence suspension or revocation, powers of radio inspectors, offences and punishments

1-4 operator certificates, applicability, eligibility, equivalents, reciprocal recognition

1-5 operation, repair and maintenance of radio apparatus on behalf of other persons

1-6 operation of radio apparatus, terms of licence, applicable standards, exempt apparatus

1-7 content restrictions - non-superfluous, profanity, secret code, music, non-commercial

1-8 installation and operating restrictions - number of stations, repeaters, home-built, club stations

1-9 participation in communications by visitors, use of station by others

1-10 interference, determination, protection from interference

1-11 emergency communications (real or simulated), communication with non-amateur stations

1-12 non-remuneration, privacy of communications

1-13 station identification, call signs, prefixes

1-14 foreign amateur operation in Canada, banned countries, third-party messages

1-15 frequency bands and qualification requirements

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- 1-16 maximum bandwidth by frequency bands
- 1-17 restrictions on capacity and power output by qualifications
- 1-18 unmodulated carriers, retransmission
- 1-19 amplitude modulation, frequency stability, measurements
- 1-20 International Telecommunication Union (ITU) Radio Regulations, applicability
- 1-21 operation outside Canada, ITU regions, reciprocal privileges, international licences
- 1-22 examinations - Department's fees, delegated examinations, fees, disabled accommodation
- 1-23 antenna structure approval, neighbour and land-use authority consultation
- 1-24 radio frequency electromagnetic field limits
- 1-25 criteria for resolution of radio frequency interference complaints
- Operating and Procedures - 002
- 2-1 voice operating procedures - channelized VHF/UHF repeater
- 2-2 phonetic alphabet
- 2-3 voice operating procedures - simplex VHF/UHF and HF
- 2-4 tuneups and testing, use of dummy load, courteous operation
- 2-5 Morse code (CW) operating procedures, procedural signs
- 2-6 RST system of signal reporting, use of S meter
- 2-7 Q signals
- 2-8 emergency operating procedures
- 2-9 record keeping, confirmation practices, maps/charts, antenna orientation
- Station Assembly, Practice and Safety - 003
- 3-1 functional layout of HF stations
- 3-2 functional layout of FM transmitters
- 3-3 functional layout of FM receivers
- 3-4 functional layout of CW transmitters
- 3-5 functional layout of SSB/CW receivers
- 3-6 functional layout of SSB transmitters
- 3-7 functional layout of digital systems
- 3-8 functional layout of regulated power supplies
- 3-9 functional layout of Yagi-Uda antennas
- 3-10 receiver fundamentals/p>

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- 3-11 transmitter, carrier, keying, and amplitude modulation fundamentals
 - 3-12 carrier suppression, SSB fundamentals
 - 3-13 frequency and phase modulation fundamentals
 - 3-14 station accessories for telegraphy, radiotelephony, digital modes
 - 3-15 digital mode fundamentals (RTTY, ASCII, AMTOR, packet)
 - 3-16 cells and batteries, types, ratings, charging
 - 3-17 power supply fundamentals
 - 3-18 electrical hazards, electrical safety, security
 - 3-19 electrical safety ground, capacitor discharge, fuse replacement
 - 3-20 antenna and tower safety, lightning protection
 - 3-21 exposure of human body to RF, safety precautions
- Circuit Components - 004
- 4-1 amplifier fundamentals
 - 4-2 diode fundamentals
 - 4-3 bipolar transistor fundamentals
 - 4-4 field-effect transistor fundamentals
 - 4-5 triode vacuum tube fundamentals
 - 4-6 resistor colour codes, tolerances, temperature coefficient
- Basic Electronics and Theory - 005
- 5-1 metric prefixes - pico, micro, milli, centi, kilo, mega, giga
 - 5-2 concepts of current, voltage, conductor, insulator, resistance
 - 5-3 concepts of energy and power, open and short circuits
 - 5-4 Ohm's law - single resistors
 - 5-5 series and parallel resistors
 - 5-6 power law, resistor power dissipation
 - 5-7 AC, sinewave, frequency, frequency units
 - 5-8 ratios, logarithms, decibels
 - 5-9 introduction to inductance, capacitance
 - 5-10 introduction to reactance, impedance
 - 5-11 introduction to magnetics, transformers
 - 5-12 introduction to resonance, tuned circuits

5-13 introduction to meters and measurements

Feedlines and Antenna Systems - 006

6-1 feed line characteristics, characteristic impedance

6-2 balanced and unbalanced feed lines, baluns

6-3 popular antenna feed line and coaxial connector types

6-4 line losses by line type, length and frequency

6-5 standing waves, standing wave ratio, SWR meter

6-6 concept of impedance matching

6-7 isotropic source, polarization via element orientation

6-8 wavelength vs physical length

6-9 gain, directivity, radiation pattern, antenna bandwidth

6-10 vertical antennas - types, dimensions, characteristics

6-11 Yagi antennas - types, dimensions, characteristics

6-12 wire antennas - types, dimensions, characteristics

6-13 quad/loop antennas - types, dimensions, characteristics

Radio Wave Propagation - 007

7-1 line of sight, ground wave, ionospheric wave (sky wave)

7-2 ionosphere, ionospheric regions (layers)

7-3 propagation hops, skip zone, skip distance

7-4 ionospheric absorption, causes and variation, fading, phase shift, Faraday rotation

7-5 solar activity, sunspots, sunspot cycle

7-6 MF and HF, critical and maximum useable frequencies, solar flux

7-7 VHF and UHF, sporadic-E, aurora, ducting

7-8 scatter - HF, VHF, UHF

Interference and Suppression - 008

8-1 front-end overload, cross-modulation

8-2 audio rectification, bypass capacitors, ferrites

8-3 intermodulation, spurious, key-clicks

8-4 harmonics, splatter, transmitter adjustments

8-5 use of filters: low-pass, high-pass, band-pass, band-reject