A-007-005-004 **(A)**

On VHF/UHF frequencies, Doppler shift becomes of consequence on which type of communication?

A Contact via satellite
B Contact through a hilltop repeater
C Simplex line-of-sight contact between hand-held transceivers
D Contact with terrestrial mobile stations

A-007-005-005 **(C)**

For VHF and UHF signals over a fixed path, what extra loss can be expected when linearly-polarized antennas are crossed-polarized (90 degrees)?

A 6 dB
B 10 dB
C 20 dB or more
D 3 dB

A-007-005-006 **(C)**

Which of the following is NOT a valid parabolic dish illumination arrangement?

A Offset feed
B Cassegrain
C Newtonian
D Front feed

A-007-005-007 **(A)**

A parabolic antenna is very efficient because:

A all the received energy is focused to a point where the pick-up antenna is located
B a dipole antenna can be used to pick up the received energy
C no impedance matching is required
D a horn-type radiator can be used to trap the received energy

A-007-005-008 **(B)**

A helical-beam antenna with right-hand polarization will best receive signals with:

A horizontal polarization
B right-hand polarization
C left-hand polarization
D vertical polarization only

A-007-005-009 **(C)**

One antenna which will respond simultaneously to vertically- and horizontally-polarized signals is the:

A ground-plane antenna
B quad antenna
C helical-beam antenna
D folded dipole antenna

A-007-005-010 **(A)**

In amateur work, what is the surface error upper limit you should try not to exceed on a parabolic reflector?

A 0.1 lambda
B 0.25 lambda
C 5 mm (0.2 in) regardless of frequency
D 1% of the diameter

A-007-005-011 **(C)**

You want to convert a surplus parabolic dish for amateur radio use, the gain of this antenna depends on:

A the focal length of the antenna
B the material composition of the dish
C the diameter of the antenna in wavelengths
D the polarization of the feed device illuminating it

A-007-006-001 **(C)**

A transmitter has an output of 100 watts. The cable and connectors have a composite loss of 3 dB, and the antenna has a gain of 6 dBd. What is the Effective Radiated Power?

A 400 watts
B 300 watts
C 200 watts
D 350 watts

A-007-006-002 **(D)**

As standing wave ratio rises, so does the loss in the transmission line. This is caused by:

A high antenna currents
B high antenna voltage
C leakage to ground through the dielectric
D dielectric and conductor heat losses

A-007-006-003 **(B)**

What is the Effective Radiated Power of an amateur transmitter, if the transmitter output power is 200 watts, the transmission line loss is 5 watts, and the antenna power gain is 3 dBd?

A 178 watts
B 390 watts
C 197 watts
D 228 watts

A-007-006-004 **(D)**

Effective Radiated Power means the:

A power supplied to the antenna before the modulation of the carrier
B power supplied to the transmission line plus antenna gain
C ratio of signal output power to signal input power
D transmitter output power, minus line losses, plus antenna gain relative to a dipole

A-007-006-005 **(C)**

A transmitter has an output power of 200 watts. The coaxial and connector losses are 3 dB in total, and the antenna gain is 9 dBd. What is the approximate Effective Radiated Power of this system?

A 1600 watts
B 400 watts
C 800 watts
D 3200 watts

A-007-006-006 **(D)**

A transmitter has a power output of 100 watts. There is a loss of 1.30 dB in the transmission line, a loss of 0.2 dB through the antenna tuner, and a gain of 4.50 dBd in the antenna. The Effective Radiated Power (ERP) is:

A 800 watts
B 400 watts
C 100 watts
D 200 watts

A-007-006-007 **(A)**

If the overall gain of an amateur station is increased by 3 dB the ERP (Effective Radiated Power) will:

A double
B decrease by 3 watts
C remain the same
D be cut in half

A-007-006-008 **(B)**

A transmitter has a power output of 125 watts. There is a loss of 0.8 dB in the transmission line, 0.2 dB in the antenna tuner, and a gain of 10 dBd in the antenna. The Effective Radiated Power (ERP) is:

A 134
B 1000
C 1250
D 1125

A-007-006-009 **(B)**

If a 3 dBd gain antenna is replaced with a 9 dBd gain antenna, with no other changes, the Effective Radiated Power (ERP) will increase by:

A 2
B 4
C 6
D 1.5

A-007-006-010 **(A)**

A transmitter has an output of 2000 watts PEP. The transmission line, connectors and antenna tuner have a composite loss of 1 dB, and the gain from the stacked Yagi antenna is 10 dBd. What is the Effective Radiated Power (ERP) in watts PEP?

A 16 000
B 18 000
C 20 000
D 2009

A-007-006-011 **(C)**

A transmitter has an output of 1000 watts PEP. The coaxial cable, connectors and antenna tuner have a composite loss of 1 dB, and the antenna gain is 10 dBd. What is the Effective Radiated Power (ERP) in watts PEP?

A 10 000
B 9000
C 8000
D 1009

A-007-007-001 **(B)**

For a 3-element Yagi antenna with horizontally mounted elements, how does the main lobe takeoff angle vary with height above flat ground?

A It depends on E-region height, not antenna height
B It decreases with increasing height
C It increases with increasing height
D It does not vary with height

A-007-007-002 **(A)**

Most simple horizontally polarized antennas do not exhibit significant directivity unless they are:

A a half wavelength or more above the ground
B an eighth of a wavelength above the ground
C a quarter wavelength above the ground
D three-eighths of a wavelength above the ground

A-007-007-003 **(C)**

The plane from which ground reflections can be considered to take place, or the effective ground plane for an antenna is:

A as much as a meter above ground
B at ground level exactly
C several centimeters to as much as 2 meters below ground, depending upon soil conditions
D as much as 6 cm below ground depending upon soil conditions

A-007-007-004 **(C)**

Why is a ground-mounted vertical quarter-wave antenna in reasonably open surroundings better for long distance contacts than a half-wave dipole at a quarter wavelength above ground?

A It has an omnidirectional characteristic
B It uses vertical polarization
C The vertical radiation angle is lower
D The radiation resistance is lower

A-007-007-005 **(A)**

When a half-wave dipole antenna is installed one-half wavelength above ground, the:

A vertical or upward radiation is effectively cancelled
B radiation pattern changes to produce side lobes at 15 and 50 degrees
C side lobe radiation is cancelled
D radiation pattern is unaffected

A-007-007-006 **(C)**

How does antenna height affect the horizontal (azimuthal) radiation pattern of a horizontal dipole HF antenna?

A If the antenna is less than one-half wavelength high, radiation off the ends of the wire is eliminated
B If the antenna is too high, the pattern becomes unpredictable
C If the antenna is less than one-half wavelength high, reflected radio waves from the ground significantly distort the pattern
D Antenna height has no effect on the pattern

A-007-007-007 **(B)**

For long distance propagation, the vertical radiation angle of the energy from the antenna should be:

A more than 30 degrees but less than 45 degrees
B less than 30 degrees
C more than 45 degrees but less than 90 degrees
D 90 degrees

A-007-007-008 **(A)**

Greater distance can be covered with multiple-hop transmissions by decreasing the:

A vertical radiation angle of the antenna
B power applied to the antenna
C main height of the antenna
D length of the antenna

A-007-007-009 **(C)**

The impedance at the centre of a dipole antenna more than 3 wavelengths above ground would be nearest to:

A 300 ohms
B 600 ohms
C 75 ohms
D 25 ohms

A-007-007-010 **(A)**

Why can a horizontal antenna closer to ground be advantageous for close range communications on lower HF bands?

A The ground tends to act as a reflector
B Lower antenna noise temperature
C Low radiation angle for closer distances
D The radiation resistance is higher

A-007-007-011 **(D)**

Which antenna system and operating frequency are most suitable for Near Vertical Incidence (NVIS) communications?

A A horizontal antenna at a height of half a wavelength and an operating frequency at the optimum working frequency
B A vertical antenna and a frequency below the maximum usable frequency
C A vertical antenna and a frequency above the lowest usable frequency
D A horizontal antenna less than 1/4 wavelength above ground and a frequency below the current critical frequency

A-007-008-001 **(C)**

What is meant by the radiation resistance of an antenna?

A The specific impedance of an antenna
B The combined losses of the antenna elements and transmission line
C The equivalent resistance that would dissipate the same amount of power as that radiated from an antenna
D The resistance in the atmosphere that an antenna must overcome to be able to radiate a signal

A-007-008-002 **(A)**

Why would one need to know the radiation resistance of an antenna?

A To match impedances for maximum power transfer
B To measure the near-field radiation density from a transmitting antenna
C To calculate the front-to-side ratio of the antenna
D To calculate the front-to-back ratio of the antenna

A-007-008-003 **(B)**

What factors determine the radiation resistance of an antenna?

A It is a physical constant and is the same for all antennas
B Antenna location with respect to nearby objects and the conductors length/diameter ratio
C Transmission line length and antenna height
D Sunspot activity and time of day

A-007-008-004 **(D)**

What is the term for the ratio of the radiation resistance of an antenna to the total resistance of the system?

A Beamwidth
B Effective Radiated Power
C Radiation conversion loss
D Antenna efficiency

A-007-008-005 **(A)**

What is included in the total resistance of an antenna system?

A Radiation resistance plus ohmic resistance
B Radiation resistance plus transmission resistance
C Transmission line resistance plus radiation resistance
D Radiation resistance plus space impedance

A-007-008-006 **(A)**

How can the approximate beamwidth of a beam antenna be determined?

A Note the two points where the signal strength is down 3 dB from the maximum signal point and compute the angular difference
B Draw two imaginary lines through the ends of the elements and measure the angle between the lines
C Measure the ratio of the signal strengths of the radiated power lobes from the front and side of the antenna
D Measure the ratio of the signal strengths of the radiated power lobes from the front and rear of the antenna

A-007-008-007 **(B)**

How is antenna percent efficiency calculated?

A (effective radiated power / transmitter output) x 100
B (radiation resistance / total resistance) x 100
C (radiation resistance / transmission resistance) x 100
D (total resistance / radiation resistance) x 100

A-007-008-008 **(D)**

What is the term used for an equivalent resistance which would dissipate the same amount of energy as that radiated from an antenna?

A j factor
B Antenna resistance
C K factor
D Radiation resistance

A-007-008-009 **(D)**

Antenna beamwidth is the angular distance between:

A the maximum lobe spread points on the major lobe
B the 6 dB power points on the major lobe
C the 3 dB power points on the first minor lobe
D the points on the major lobe at the half-power points

A-007-008-010 **(A)**

If the ohmic resistance of a half-wave dipole is 2 ohms, and the radiation resistance is 72 ohms, what is the antenna efficiency?

A 97.3%
B 74%
C 72%
D 100%

A-007-008-011 **(D)**

If the ohmic resistance of a miniloop antenna is 2 milliohms and the radiation resistance is 50 milliohms, what is the antenna efficiency?

A 52%
B 25%
C 50%
D 96.15%

A-007-009-001 **(A)**

Waveguide is typically used:

A at frequencies above 3000 MHz
B at frequencies above 2 MHz
C at frequencies below 150 MHz
D at frequencies below 1500 MHz

A-007-009-002 **(B)**

Which of the following is not correct? Waveguide is an efficient transmission medium because it features:

A low copper loss
B low hysteresis loss
C low radiation loss
D low dielectric loss

A-007-009-003 **(B)**

Which of the following is an advantage of waveguide as a transmission line?

A Heavy and difficult to install
B Low loss
C Frequency sensitive based on dimensions
D Expensive

A-007-009-004 **(D)**

For rectangular waveguide to transfer energy, the cross-section should be at least:

A three-eighths wavelength
B one-eighth wavelength
C one-quarter wavelength
D one-half wavelength

A-007-009-005 **(C)**

Which of the following statements about waveguide IS NOT correct?

A In the transverse magnetic mode, a component of the electric field is in the direction of propagation
B Waveguide has low loss at high frequencies, but high loss below cutoff frequency
C Waveguide has high loss at high frequencies, but low loss below cutoff frequency
D In the transverse electric mode, a component of the magnetic field is in the direction of propagation

A-007-009-006 **(A)**

Which of the following is a major advantage of waveguide over coaxial cable for use at microwave frequencies?

A Very low losses
B Frequency response from 1.8 MHz to 24GHz
C Easy to install
D Inexpensive to install

A-007-009-007 **(C)**

What is printed circuit transmission line called?

A Dielectric imprinting
B Ground plane
C Microstripline
D Dielectric substrate

A-007-009-008 **(C)**

Compared with coaxial cable, microstripline:

A must have much lower characteristic impedance
B must have much higher characteristic impedance
C has poorer shielding
D has superior shielding

A-007-009-009 **(C)**

A section of waveguide:

A operates like a band-stop filter
B is lightweight and easy to install
C operates like a high-pass filter
D operates like a low-pass filter

A-007-009-010 **(A)**

Stripline is a:

A printed circuit transmission line
B small semiconductor family
C high power microwave antenna
D family of fluids for removing coatings from small parts

A-007-009-011 **(C)**

What precautions should you take before beginning repairs on a microwave feed horn or waveguide?

A Be sure propagation conditions are unfavourable for tropospheric ducting
B Be sure to wear tight-fitting clothes and gloves to protect your body and hands from sharp edges
C Be sure the transmitter is turned off and the power source is disconnected
D Be sure the weather is dry and sunny