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

To obtain efficient transfer of power from a transmitter to an antenna, it is important that there is a:

A matching of impedance
B high load impedance
C proper method of balance
D low load resistance

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

If an antenna is correctly matched to a transmitter, the length of transmission line:

A will have no effect on the matching
B must be a full wavelength long
C must be an odd number of quarter-wave
D must be an even number of half-waves

B-006-006-010 **(A)**

The reason that an RF transmission line should be matched at the transmitter end is to:

A transfer the maximum amount of power to the antenna
B ensure that the radiated signal has the intended polarization
C prevent frequency drift
D overcome fading of the transmitted signal

B-006-006-011 **(C)**

If the centre impedance of a folded dipole is approximately 300 ohms, and you are using RG8U (50 ohms) coaxial lines, what is the ratio required to have the line and the antenna matched?

A 4:1
B 10:1
C 6:1
D 2:1

B-006-007-001 **(B)**

What does horizontal wave polarization mean?

A The magnetic lines of force of a radio wave are parallel to the Earth's surface
B The electric lines of force of a radio wave are parallel to the Earth's surface
C The electric and magnetic lines of force of a radio wave are perpendicular to the Earth's surface
D The electric lines of force of a radio wave are perpendicular to the Earth's surface

B-006-007-002 **(C)**

What does vertical wave polarization mean?

A The electric and magnetic lines of force of a radio wave are parallel to the Earth's surface
B The electric lines of force of a radio wave are parallel to the Earth's surface
C The electric lines of force of a radio wave are perpendicular to the Earth's surface
D The magnetic lines of force of a radio wave are perpendicular to the Earth's surface

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

What electromagnetic wave polarization does a Yagi antenna have when its elements are parallel to the Earth's surface?

A Circular
B Horizontal
C Helical
D Vertical

B-006-007-004 **(B)**

What electromagnetic wave polarization does a half-wavelength antenna have when it is perpendicular to the Earth's surface?

A Parabolical
B Vertical
C Circular
D Horizontal

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

Polarization of an antenna is determined by:

A the orientation of the electric field relative to the Earth's surface
B the height of the antenna
C the type of antenna
D the magnetic field

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

An isotropic antenna is:

A a hypothetical point source
B an infinitely long piece of wire
C a dummy load
D a half-wave reference dipole

B-006-007-007 **(C)**

What is the antenna radiation pattern for an isotropic radiator?

A A cardioid
B A unidirectional cardioid
C A sphere
D A parabola

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

VHF signals from a mobile station using a vertical whip antenna will normally be best received using a:

A horizontal dipole antenna
B vertical ground-plane antenna
C random length of wire
D horizontal ground-plane antenna

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

A dipole antenna will emit a vertically polarized wave if it is:

A fed with the correct type of RF
B too near to the ground
C parallel with the ground
D mounted vertically

B-006-007-010 **(D)**

If an electromagnetic wave leaves an antenna vertically polarized, it will arrive at the receiving antenna, by ground wave:

A polarized at right angles to original
B horizontally polarized
C polarized in any plane
D vertically polarized

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

Compared with a horizontal antenna, a vertical antenna will receive a vertically polarized radio wave:

A without any comparative difference
B if the antenna changes the polarization
C at greater strength
D at weaker strength

B-006-008-001 **(B)**

If an antenna is made longer, what happens to its resonant frequency?

A It disappears
B It decreases
C It increases
D It stays the same

B-006-008-002 **(B)**

If an antenna is made shorter, what happens to its resonant frequency?

A It decreases
B It increases
C It stays the same
D It disappears

B-006-008-003 **(C)**

The wavelength for a frequency of 25 MHz is:

A 4 metres (13.1 ft)
B 32 metres (105 ft)
C 12 metres (39.4 ft)
D 15 metres (49.2 ft)

B-006-008-004 **(A)**

The velocity of propagation of radio frequency energy in free space is:

A 300 000 kilometres per second
B 3000 kilometres per second
C 150 kilometres per second
D 186 000 kilometres per second

B-006-008-005 **(B)**

Adding a series inductance to an antenna would:

A have no change on the resonant frequency
B decrease the resonant frequency
C increase the resonant frequency
D have little effect

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

The resonant frequency of an antenna may be increased by:

A shortening the radiating element
B lowering the radiating element
C increasing the height of the radiating element
D lengthening the radiating element

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

The speed of a radio wave:

A is the same as the speed of light
B is infinite in space
C is always less than half speed of light
D varies directly with frequency

B-006-008-008 **(C)**

At the end of suspended antenna wire, insulators are used. These act to:

A allow the antenna to be more easily held vertically
B prevent any loss of radio waves by the antenna
C limit the electrical length of the antenna
D increase the effective antenna length

B-006-008-009 **(B)**

To lower the resonant frequency of an antenna, the operator should:

A centre feed it with TV ribbon transmission line
B lengthen it
C shorten it
D ground one end

B-006-008-010 **(D)**

One solution to multiband operation with a shortened radiator is the "trap dipole" or trap vertical. These "traps" are actually:

A large wire-wound resistors
B coils wrapped around a ferrite rod
C hollow metal cans
D a coil and capacitor in parallel

B-006-008-011 **(C)**

The wavelength corresponding to a frequency of 2 MHz is:

A 1500 m (4921 ft)
B 30 m (98 ft)
C 150 m (492 ft)
D 360 m (1181 ft)

B-006-009-001 **(B)**

What is a parasitic beam antenna?

A An antenna where wave traps are used to magnetically couple the elements
B An antenna where some elements obtain their radio energy by induction or radiation from a driven element
C An antenna where the driven element obtains its radio energy by induction or radiation from director elements
D An antenna where all elements are driven by direct connection to the transmission line

B-006-009-002 **(D)**

How can the bandwidth of a parasitic beam antenna be increased?

A Use traps on the elements
B Use tapered-diameter elements
C Use closer element spacing
D Use larger diameter elements

B-006-009-003 **(D)**

If a parasitic element slightly shorter than a horizontal dipole antenna is placed parallel to the dipole 0.1 wavelength from it and at the same height, what effect will this have on the antenna's radiation pattern?

A A major lobe will develop in the horizontal plane, parallel to the two elements
B A major lobe will develop in the vertical plane, away from the ground
C The radiation pattern will not be affected
D A major lobe will develop in the horizontal plane, from the dipole toward the parasitic element

B-006-009-004 **(C)**

If a parasitic element slightly longer than a horizontal dipole antenna is placed parallel to the dipole 0.1 wavelength from it and at the same height, what effect will this have on the antenna's radiation pattern?

A A major lobe will develop in the vertical plane, away from the ground
B The radiation pattern will not be affected
C A major lobe will develop in the horizontal plane, from the parasitic element toward the dipole
D A major lobe will develop in the horizontal plane, parallel to the two elements

B-006-009-005 **(D)**

The property of an antenna, which defines the range of frequencies to which it will respond, is called its:

A front-to-back ratio
B impedance
C polarization
D bandwidth

B-006-009-006 **(B)**

Approximately how much gain does a half-wave dipole have over an isotropic radiator?

A 6.0 dB
B 2.1 dB
C 1.5 dB
D 3.0 dB

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

What is meant by antenna gain?

A The power amplifier gain minus the transmission line losses
B The numerical ratio relating the radiated signal strength of an antenna to that of another antenna
C The numerical ratio of the signal in the forward direction to the signal in the back direction
D The numerical ratio of the amount of power radiated by an antenna compared to the transmitter output power

B-006-009-008 **(C)**

What is meant by antenna bandwidth?

A The angle between the half-power radiation points
B The angle formed between two imaginary lines drawn through the ends of the elements
C The frequency range over which the antenna may be expected to perform well
D Antenna length divided by the number of elements

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

In free space, what is the radiation characteristic of a half-wave dipole?

A Minimum radiation from the ends, maximum broadside
B Maximum radiation from the ends, minimum broadside
C Omnidirectional
D Maximum radiation at 45 degrees to the plane of the antenna

B-006-009-010 **(B)**

The gain of an antenna, especially on VHF and above, is quoted in dBi. The "i" in this expression stands for:

A interpolated
B isotropic
C ideal
D ionosphere

B-006-009-011 **(B)**

The front-to-back ratio of a beam antenna is:

A the ratio of the forward power at the 3 dB points to the power radiated in the backward direction
B the ratio of the maximum forward power in the major lobe to the maximum backward power radiation
C the forward power of the major lobe to the power in the backward direction both being measured at the 3 dB points
D undefined

B-006-010-001 **(B)**

How do you calculate the length in metres (feet) of a quarter-wavelength antenna using frequencies below 30MHz?

A Divide 150 (491) by the antenna's operating frequency in MHz
B Divide 71.5 (234) by the antenna's operating frequency in MHz
C Divide 468 (1532) by the antenna's operating frequency in MHz
D Divide 300 (982) by the antenna's operating frequency in MHz

B-006-010-002 **(B)**

If you made a quarter-wavelength vertical antenna for 21.125 MHz, approximately how long would it be?

A 6.76 metres (22.2 ft)
B 3.36 metres (11.0 ft)
C 3.6 metres (11.8 ft)
D 7.2 metres (23.6 ft)

B-006-010-003 **(C)**

If you made a half-wavelength vertical antenna for 223 MHz, approximately how long would it be?

A 105 cm (41.3 in)
B 134.6 cm (53 in)
C 67 cm (26.4 in)
D 128 cm (50.4 in)

B-006-010-004 **(B)**

Why is a 5/8-wavelength vertical antenna better than a 1/4-wavelength vertical antenna for VHF or UHF mobile operations?

A A 5/8-wavelength antenna can handle more power
B A 5/8-wavelength antenna has more gain
C A 5/8-wavelength antenna has less corona loss
D A 5/8-wavelength antenna is easier to install on a car

B-006-010-005 **(C)**

If a magnetic-base whip antenna is placed on the roof of a car, in what direction does it send out radio energy?

A Most of it goes equally in two opposite directions
B Most of it goes in one direction
C It goes out equally well in all horizontal directions
D Most of it is aimed high into the sky

B-006-010-006 **(D)**

What is an advantage of downward sloping radials on a ground plane antenna?

A It increases the radiation angle
B It brings the feed point impedance closer to 300 ohms
C It lowers the radiation angle
D It brings the feed point impedance closer to 50 ohms

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

What happens to the feed point impedance of a ground-plane antenna when its radials are changed from horizontal to downward-sloping?

A It increases
B It decreases
C It stays the same
D It approaches zero

B-006-010-008 **(B)**

Which of the following transmission lines will give the best match to the base of a quarter-wave ground-plane antenna?

A 300 ohms coaxial cable
B 50 ohms coaxial cable
C 300 ohms balanced transmission line
D 75 ohms balanced transmission line

B-006-010-009 **(C)**

The main characteristic of a vertical antenna is that it will:

A require few insulators
B be easy to feed with TV ribbon transmission line
C receive signals equally well from all compass points around it
D be very sensitive to signals coming from horizontal antennas

B-006-010-010 **(B)**

Why is a loading coil often used with an HF mobile vertical antenna?

A To filter out electrical noise
B To tune out capacitive reactance
C To lower the losses
D To lower the Q

B-006-010-011 **(D)**

What is the main reason why so many VHF base and mobile antennas are 5/8 of a wavelength?

A The angle of radiation is high giving excellent local coverage
B It is easy to match the antenna to the transmitter
C It's a convenient length on VHF
D The angle of radiation is low

B-006-011-001 **(A)**

How many directly driven elements do most Yagi antennas have?

A One
B Two
C Three
D None

B-006-011-002 **(C)**

Approximately how long is the driven element of a Yagi antenna for 14.0 MHz?

A 10.67 metres (35 feet)
B 20.12 metres (66 feet)
C 10.21 metres (33.5 feet)
D 5.21 metres (17 feet)

B-006-011-003 **(B)**

Approximately how long is the director element of a Yagi antenna for 21.1 MHz?

A 12.8 metres (42 feet)
B 6.4 metres (21 feet)
C 5.18 metres (17 feet)
D 3.2 metres (10.5 feet)

B-006-011-004 **(A)**

Approximately how long is the reflector element of a Yagi antenna for 28.1 MHz?

A 5.33 metres (17.5 feet)
B 4.88 metres (16 feet)
C 10.67 metres (35 feet)
D 2.66 metres (8.75 feet)

B-006-011-005 **(A)**

What is one effect of increasing the boom length and adding directors to a Yagi antenna?

A Gain increases
B SWR increases
C Weight decreases
D Wind load decreases

B-006-011-006 **(A)**

What are some advantages of a Yagi with wide element spacing?

A High gain, less critical tuning and wider bandwidth
B High gain, lower loss and a low SWR
C High front-to-back ratio and lower input resistance
D Shorter boom length, lower weight and wind resistance

B-006-011-007 **(D)**

Why is a Yagi antenna often used for radiocommunications on the 20-metre band?

A It provides excellent omnidirectional coverage in the horizontal plane
B It is smaller, less expensive and easier to erect than a dipole or vertical antenna
C It provides the highest possible angle of radiation for the HF bands
D It helps reduce interference from other stations off to the side or behind

B-006-011-008 **(D)**

What does "antenna front-to-back ratio" mean in reference to a Yagi antenna?

A The relative position of the driven element with respect to the reflectors and directors
B The power radiated in the major radiation lobe compared to the power radiated 90 degrees away from that direction
C The number of directors versus the number of reflectors
D The power radiated in the major radiation lobe compared to the power radiated in exactly the opposite direction

B-006-011-009 **(C)**

What is a good way to get maximum performance from a Yagi antenna?

A Use a reactance bridge to measure the antenna performance from each direction around the antenna
B Avoid using towers higher than 9 metres (30 feet) above the ground
C Optimize the lengths and spacing of the elements
D Use RG-58 transmission line