

**B-003-018-006 (D)**

Which body organ can be fatally affected by a very small amount of electrical current?

- A The brain
- B The liver
- C The lungs
- D The heart

**B-003-018-007 (A)**

What is the minimum voltage which is usually dangerous to humans?

- A 30 volts
- B 100 volts
- C 1000 volts
- D 2000 volts

**B-003-018-008 (A)**

What should you do if you discover someone who is being burned by high voltage?

- A Turn off the power, call for emergency help and provide first-aid if needed
- B Wait for a few minutes to see if the person can get away from the high voltage on their own, then try to help
- C Immediately drag the person away from the high voltage
- D Run from the area so you won't be burned too

**B-003-018-009 (A)**

What is the safest method to remove an unconscious person from contact with a high voltage source?

- A Turn off the high voltage switch before removing the person from contact with the source
- B Wrap the person in a blanket and pull him to a safe area
- C Call an electrician
- D Remove the person by pulling an arm or a leg

**B-003-018-010 (D)**

Before checking a fault in a mains operated power supply unit, it would be safest to first:

- A short out leads of filter capacitor
- B check action of capacitor bleeder resistance
- C remove and check fuse from power supply
- D turn off the power and remove power plug

**B-003-018-011 (D)**

Fault finding in a power supply of an amateur transmitter while the supply is operating is not a recommended technique because of the risk of:

- A damaging the transmitter
- B overmodulation
- C blowing the fuse
- D electric shock

**B-003-019-001 (A)**

For best protection from electrical shock, what should be grounded in an amateur station?

- A All station equipment
- B The antenna transmission line
- C The AC power line
- D The power supply primary

**B-003-019-002 (A)**

If a separate ground system is not possible for your amateur station, an alternative indoor grounding point could be:

- A a metallic cold water pipe
- B a plastic cold water pipe
- C a window screen
- D a metallic natural gas pipe

**B-003-019-003 (D)**

To protect you against electrical shock, the chassis of each piece of your station equipment should be connected to:

- A a dummy load
- B insulated shock mounts
- C the antenna
- D a good ground connection

**B-003-019-004 (A)**

Which of these materials is best for a ground rod driven into the earth?

- A Copper-clad steel
- B Hard plastic
- C Iron or steel
- D Fiberglass

**B-003-019-005 (B)**

If you ground your station equipment to a ground rod driven into the earth, what is the shortest length the rod should be?

- A 3 metres (10 ft)
- B The station ground system must conform to applicable electrical code requirements
- C 1.2 metre (4 ft)
- D 2.5 metres (8 ft)

**B-003-019-006 (C)**

Where should the green wire in a three-wire AC line cord be connected in a power supply?

- A To the "hot" side of the power switch
- B To the fuse
- C To the chassis
- D To the white wire

**B-003-019-007 (D)**

If your third-floor amateur station has a ground wire running 10 metres (33 feet) down to a ground rod, why might you get an RF burn if you touch the front panel of your HF transceiver?

- A Because of a bad antenna connection, allowing the RF energy to take an easier path out of the transceiver through you
- B Because the transceiver's heat-sensing circuit is not working to start the cooling fan
- C Because the ground rod is not making good contact with moist earth
- D Because the ground wire has significant reactance and acts more like an antenna than an RF ground connection

**B-003-019-008 (D)**

What is one good way to avoid stray RF energy in your amateur station?

- A Make a couple of loops in the ground wire where it connects to your station
- B Drive the ground rod at least 4m (14 feet) into the ground
- C Use a beryllium ground wire for best conductivity
- D Keep the station's ground wire as short as possible

**B-003-019-009 (B)**

Which statement about station grounding is true?

- A The chassis of each piece of station equipment should be tied together with high-impedance conductors
- B RF hot spots can occur in a station located above the ground floor if the equipment is grounded by a long ground wire
- C A ground loop is an effective way to ground station equipment
- D If the chassis of all station equipment is connected with a good conductor, there is no need to tie them to an earth ground

**B-003-019-010 (A)**

On mains operated power supplies, the ground wire should be connected to the metal chassis of the power supply. This ensures, in case there is a fault in the power supply, that the chassis:

- A does not develop a high voltage with respect to the ground
- B does not become conductive to prevent electric shock
- C becomes conductive to prevent electric shock
- D develops a high voltage compared to the ground

**B-003-019-011 (B)**

The purpose of using a three-wire power cord and plug on amateur radio equipment is to:

- A make it inconvenient to use
- B prevent the chassis from becoming live
- C prevent the plug from being reversed in the wall outlet
- D prevent internal short circuits

**B-003-020-001 (D)**

Why should you ground all antenna and rotator cables when your amateur station is not in use?

- A To lock the antenna system in one position
- B To avoid radio frequency interference
- C To make sure everything will stay in place
- D To help protect the station equipment and building from lightning damage

**B-003-020-002 (B)**

You want to install a lightning arrestor on your antenna transmission line, where should it be inserted?

- A Anywhere on the line
- B Outside, as close to earth grounding as possible
- C Close to the antenna
- D Behind the transceiver

**B-003-020-003 (D)**

How can amateur station equipment best be protected from lightning damage?

- A Use heavy insulation on the wiring
- B Never turn off the equipment
- C Disconnect the ground system from all radios
- D Disconnect all equipment from the power lines and antenna cables

**B-003-020-004 (D)**

What equipment should be worn for working on an antenna tower?

- A A reflective vest of approved colour
- B A flashing red, yellow or white light
- C A grounding chain
- D Approved equipment in accordance with applicable standards concerning fall protection

**B-003-020-005 (B)**

Why should you wear approved fall arrest equipment if you are working on an antenna tower?

- A To safely hold your tools so they don't fall and injure someone on the ground
- B To prevent you from accidentally falling
- C To safely bring any tools you might use up and down the tower
- D To keep the tower from becoming unbalanced while you are working

**B-003-020-006 (A)**

For safety, how high should you place a horizontal wire antenna?

- A High enough so that no one can touch any part of it from the ground
- B Above high-voltage electrical lines
- C Just high enough so you can easily reach it for adjustments or repairs
- D As close to the ground as possible

**B-003-020-007 (B)**

Why should you wear a hard hat if you are on the ground helping someone work on an antenna tower?

- A So someone passing by will know that work is being done on the tower and will stay away
- B To protect your head from something dropped from the tower
- C So you won't be hurt if the tower should accidentally fall
- D To keep RF energy away from your head during antenna testing

**B-003-020-008 (D)**

Why should your outside antennas be high enough so that no one can touch them while you are transmitting?

- A Touching the antenna might reflect the signal back to the transmitter and cause damage
- B Touching the antenna might radiate harmonics
- C Touching the antenna might cause television interference
- D Touching the antenna might cause RF burns

**B-003-020-009 (A)**

Why should you make sure that no one can touch an open wire transmission line while you are transmitting with it?

- A Because high-voltage radio energy might burn the person
- B Because contact might break the transmission line
- C Because contact might cause spurious emissions
- D Because contact might cause a short circuit and damage the transmitter

**B-003-020-010 (C)**

What safety precautions should you take before beginning repairs on an antenna?

- A Inform your neighbours so they are aware of your intentions
- B Turn off the main power switch in your house
- C Be sure to turn off the transmitter and disconnect the transmission line
- D Be sure you and the antenna structure are grounded

**B-003-020-011 (A)**

What precaution should you take when installing a ground-mounted antenna?

- A It should be installed so no one can come in contact with it
- B It should be painted so people or animals do not accidentally run into it
- C It should not be installed in a wet area
- D It should not be installed higher than you can reach

**B-003-021-001 (C)**

What should you do for safety when operating at UHF and microwave frequencies?

- A Make sure the standing wave ratio is low before you conduct a test
- B Never use a horizontally polarized antenna
- C Keep antenna away from your eyes when RF is applied
- D Make sure that an RF leakage filter is installed at the antenna feed point

**B-003-021-002 (B)**

What should you do for safety if you put up a UHF transmitting antenna?

- A Make sure that RF field screens are in place
- B Make sure the antenna will be in a place where no one can get near it when you are transmitting
- C Make sure the antenna is near the ground to keep its RF energy pointing in the correct direction
- D Make sure you connect an RF leakage filter at the antenna feed point

**B-003-021-003 (B)**

What should you do for safety, before removing the shielding on a UHF power amplifier?

- A Make sure all RF screens are in place at the antenna transmission line
- B Make sure the amplifier cannot accidentally be turned on
- C Make sure that RF leakage filters are connected
- D Make sure the antenna transmission line is properly grounded

**B-003-021-004 (D)**

Why should you make sure the antenna of a hand-held transceiver is not close to your head when transmitting?

- A To use your body to reflect the signal in one direction
- B To keep static charges from building up
- C To help the antenna radiate energy equally in all directions
- D To reduce your exposure to the radio-frequency energy

**B-003-021-005 (A)**

How should you position the antenna of a hand-held transceiver while you are transmitting?

- A Away from your head and away from others
- B Pointed towards the station you are contacting
- C Pointed away from the station you are contacting
- D Pointed down to bounce the signal off the ground

**B-003-021-006 (B)**

How can exposure to a large amount of RF energy affect body tissue?

- A It causes hair to fall out
- B It heats the tissue
- C It lowers blood pressure
- D It paralyzes the tissue

**B-003-021-007 (D)**

Which body organ is the most likely to be damaged from the heating effects of RF radiation?

- A Heart
- B Liver
- C Hands
- D Eyes

**B-003-021-008 (C)**

Depending on the wavelength of the signal, the energy density of the RF field, and other factors, in what way can RF energy affect body tissue?

- A It causes blood flow to stop
- B It has no effect on the body
- C It heats the tissue
- D It causes ionizing radiation poisoning

**B-003-021-009 (A)**

If you operate your amateur station with indoor antennas, what precautions should you take when you install them?

- A Locate the antennas as far away as possible from living spaces that will be occupied while you are operating
- B Position the antennas parallel to electrical power wires to take advantage of parasitic effects
- C Position the antennas along the edge of a wall where it meets the floor or ceiling to reduce parasitic radiation
- D Locate the antennas close to your operating position to minimize transmission line length

**B-003-021-010 (C)**

Why should directional high-gain antennas be mounted higher than nearby structures?

- A So they will not damage nearby structures with RF energy
- B So they will receive more sky waves and fewer ground waves
- C So they will not direct RF energy toward people in nearby structures
- D So they will be dried by the wind after a heavy rain storm

**B-003-021-011 (A)**

For best RF safety, where should the ends and center of a dipole antenna be located?

- A As high as possible to prevent people from coming in contact with the antenna
- B Near or over moist ground so RF energy will be radiated away from the ground
- C As close to the transmitter as possible so RF energy will be concentrated near the transmitter
- D Close to the ground so simple adjustments can be easily made without climbing a ladder

**B-004-001-001 (A)**

A circuit designed to increase the level of its input signal is called:

- A an amplifier
- B a modulator
- C an oscillator
- D a receiver

**B-004-001-002 (A)**

If an amplifier becomes non-linear, the output signal would:

- A become distorted
- B be saturated
- C cause oscillations
- D overload the power supply

**B-004-001-003 (B)**

To increase the level of very weak radio signals from an antenna, you would use:

- A an audio amplifier
- B an RF amplifier
- C an RF oscillator
- D an audio oscillator

B-004-001-004 (B)

To increase the level of very weak signals from a microphone you would use:

- A an audio oscillator
- B an audio amplifier
- C an RF oscillator
- D an RF amplifier

B-004-001-005 (A)

The range of frequencies to be amplified by a speech amplifier is typically:

- A 300 to 3000 Hz
- B 3 to 300 Hz
- C 300 to 1000 Hz
- D 40 to 40 000 Hz

B-004-001-006 (B)

Which of the following is not amplified by an amplifier?

- A Voltage
- B Resistance
- C Current
- D Power

B-004-001-007 (A)

The increase in signal level by an amplifier is called:

- A gain
- B attenuation
- C amplitude
- D modulation

B-004-001-008 (C)

A device with gain has the property of:

- A oscillation
- B modulation
- C amplification
- D attenuation

B-004-001-009 (B)

A device labelled "Gain = 10 dB" is likely to be an:

- A audio fader
- B amplifier
- C attenuator
- D oscillator

B-004-001-010 (C)

Amplifiers can amplify:

- A voltage, power, or inductance
- B voltage, current, or inductance
- C voltage, current, or power
- D current, power, or inductance

B-004-001-011 (B)

Which of the following is not a property of an amplifier?

- A Distortion
- B Loss
- C Gain
- D Linearity

B-004-002-001 (A)

Zener diodes are used as:

- A voltage regulators
- B current regulators
- C RF detectors
- D AF detectors

B-004-002-002 (D)

One important application for diodes is recovering information from transmitted signals. This is referred to as:

- A regeneration
- B ionization
- C biasing
- D demodulation

B-004-002-003 (A)

The primary purpose of a Zener diode is to:

- A regulate or maintain a constant voltage
- B provide a voltage phase shift
- C to boost the power supply voltage
- D provide a path through which current can flow

B-004-002-004 (C)

The action of changing alternating current to direct current is called:

- A transformation
- B modulation
- C rectification
- D amplification

B-004-002-005 (C)

The electrodes of a semiconductor diode are known as:

- A collector and base
- B cathode and drain
- C anode and cathode
- D gate and source

B-004-002-006 (B)

If alternating current is applied to the anode of a diode, what would you expect to see at the cathode?

- A Pulsating alternating current
- B Pulsating direct current
- C No signal
- D Steady direct current

B-004-002-007 (C)

In a semiconductor diode, electrons flow from:

- A cathode to grid
- B grid to anode
- C cathode to anode
- D anode to cathode

B-004-002-008 (B)

What semiconductor device glows different colours, depending upon its chemical composition?

- A A vacuum diode
- B A light-emitting diode
- C A fluorescent bulb
- D A neon bulb

B-004-002-009 (A)

Voltage regulation is the principal application of the:

- A Zener diode
- B junction diode
- C light-emitting diode
- D vacuum diode

B-004-002-010 (A)

In order for a diode to conduct, it must be:

- A forward-biased
- B close coupled
- C enhanced
- D reverse-biased

B-004-003-001 (A)

Which component can amplify a small signal using low voltages?

- A A PNP transistor
- B A variable resistor
- C An electrolytic capacitor
- D A multiple-cell battery

B-004-003-002 (A)

The basic semiconductor amplifying device is the:

- A transistor
- B tube
- C P-N junction
- D diode

B-004-003-003 (D)

The three leads from a PNP transistor are named:

- A drain, base and source
- B collector, source and drain
- C gate, source and drain
- D collector, emitter and base

B-004-003-004 (A)

If a low level signal is placed at the input to a transistor, a higher level of signal is produced at the output lead. This effect is known as:

- A amplification
- B detection
- C modulation
- D rectification

B-004-003-005 (D)

Bipolar transistors usually have:

- A 1 lead
- B 2 leads
- C 4 leads
- D 3 leads

B-004-003-006 (B)

A semiconductor is described as a "general purpose audio NPN device". This would be:

- A an audio detector
- B a bipolar transistor
- C a silicon diode
- D a triode