

**2020-2024 Amateur Extra Class
FCC Element 4 Question Pool
Effective 7/01/2020 – 6/30/2024**

SUBELEMENT E0 – SAFETY - [1 exam question -- 1 group]

E0A Safety: RF radiation hazards; hazardous materials; grounding

E0A01

What is the primary function of an external earth connection or ground rod?

- A. Reduce received noise
- B. Lightning protection**
- C. Reduce RF current flow between pieces of equipment
- D. Reduce RFI to telephones and home entertainment systems

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E0A02

When evaluating RF exposure levels from your station at a neighbor's home, what must you do?

- A. Ensure signals from your station are less than the controlled Maximum Permitted Exposure (MPE) limits
- B. Ensure signals from your station are less than the uncontrolled Maximum Permitted Exposure (MPE) limits**
- C. Ensure signals from your station are less than the controlled Maximum Permitted Emission (MPE) limits
- D. Ensure signals from your station are less than the uncontrolled Maximum Permitted Emission (MPE) limits

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E0A03

Over what range of frequencies are the FCC human body RF exposure limits most restrictive?

- A. 300 kHz to 3 MHz
- B. 3 to 30 MHz
- C. 30 to 300 MHz**
- D. 300 to 3000 MHz

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E0A04

When evaluating a site with multiple transmitters operating at the same time, the operators and licensees of which transmitters are responsible for mitigating over-exposure situations?

- A. Only the most powerful transmitter
- B. Only commercial transmitters
- C. Each transmitter that produces 5 percent or more of its MPE limit in areas where the total MPE limit is exceeded.**
- D. Each transmitter operating with a duty cycle greater than 50 percent

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E0A05

What is one of the potential hazards of operating in the amateur radio microwave bands?

- A. Microwaves are ionizing radiation
- B. The high gain antennas commonly used can result in high exposure levels
- C. Microwaves often travel long distances by ionospheric reflection
- D. The extremely high frequency energy can damage the joints of antenna structures

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E0A06

Why are there separate electric (E) and magnetic (H) field MPE limits?

- A. The body reacts to electromagnetic radiation from both the E and H fields
- B. Ground reflections and scattering make the field strength vary with location
- C. E field and H field radiation intensity peaks can occur at different locations
- D. All these choices are correct

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E0A07

How may dangerous levels of carbon monoxide from an emergency generator be detected?

- A. By the odor
- B. Only with a carbon monoxide detector
- C. Any ordinary smoke detector can be used
- D. By the yellowish appearance of the gas

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E0A08

What does SAR measure?

- A. Synthetic Aperture Ratio of the human body
- B. Signal Amplification Rating
- C. The rate at which RF energy is absorbed by the body
- D. The rate of RF energy reflected from stationary terrain

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E0A09

Which insulating material commonly used as a thermal conductor for some types of electronic devices is extremely toxic if broken or crushed and the particles are accidentally inhaled?

- A. Mica
- B. Zinc oxide
- C. Beryllium Oxide
- D. Uranium Hexafluoride

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E0A10

What toxic material may be present in some electronic components such as high voltage capacitors and transformers?

- A. Polychlorinated biphenyls
- B. Polyethylene
- C. Polytetrafluoroethylene
- D. Polymorphic silicon

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E0A11

Which of the following injuries can result from using high-power UHF or microwave transmitters?

- A. Hearing loss caused by high voltage corona discharge
- B. Blood clotting from the intense magnetic field
- C. Localized heating of the body from RF exposure in excess of the MPE limits
- D. Ingestion of ozone gas from the cooling system

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