

## Ionization Chambers and Electrometers

91. A free-air ionization chamber is an instrument used to measure:
- A. The charge of free electrons in a radiation beam
  - B. Ionization produced in a well specified volume of air according to the definition of roentgen
  - C. Charge particle equilibrium
  - D. Number of ionization tracks produced by electrons
92. Ionization chambers if not sealed require their readings to be corrected for temperature and pressure because:
- A. Walls of the chamber expand and shrink with temperature
  - B. The collecting electrodes electrical conductivity changes
  - C. The volume of the air changes
  - D. Mass of the air in the chamber changes
93. Thimble chambers are used to calibrate radiation beams because:
- A. These are sturdy
  - B. They have good spatial resolution
  - C. They do not significantly perturb the beams
  - D. All of the above
94. Thimble chamber walls:
- A. Are made from high Z atomic number material
  - B. Need be very thick
  - C. Are air-equivalent
  - D. Are made of ferromagnetic material
95. Parallel-plate ionization chambers are primarily used to measure:
- A. Ionization at deeper locations in a phantom
  - B. Surface dose
  - C. Scattered radiation dose
  - D. Interstitial dose
96. The most common wall material used for the outer wall of the ionization chamber is:
- A. Aluminum
  - B. Cu
  - C. Graphite or nylon
  - D. Lead

97. Which of the following is not a desirable characteristic of an ionization chamber:

- A. Energy independence
- B. High signal to noise ratio
- C. Change in sensitivity with the direction of the incident beam
- D. Reproducibility

98. Calibration of an ionization chamber means it has been:

- A. Exposed to radiation to stabilize
- B. Compared against a national standard to establish a correction factor
- C. Tested against leakage and electrical shorts
- D. Made waterproof

99. An electrometer is an instrument used to measure:

- A. Charge, current
- B. Voltage, resistance
- C. Capacitance
- D. All of the above