

Name: _____

Class: _____

Experience 3: Electromagnetic radiation and matter

1. **When a photon encounters matter, what can happen to a bound electron?**
 - a) It can be excited to a higher energy state within the atom
 - b) It can ionize the atom giving it a positive charge.
 - c) Both a and b
 - d) None of the above.
2. **What happens when an electron in an excited state descends to a lower energy state?**
 - a) It absorbs energy
 - b) It emits a photon
 - c) It becomes ionized
 - d) It remains stationary
3. **What causes the distinct colors emitted by noble gases in gas discharge tubes?**
 - a) The temperature of the gas
 - b) The energy levels of electrons in the atoms
 - c) The pressure of the gas
 - d) The type of photon emitted
4. **What is ionizing radiation?**
 - a) EM Radiation that causes heating
 - b) Radiation that is harmless to living tissue
 - c) Radiation that can only be reflected
 - d) EM Radiation that can ionize matter and break chemical bonds
5. **What materials are typically transparent to X-ray radiation?**
 - a) Skin and tissue
 - b) Metal
 - c) Lead
 - d) Iron
6. **What is a blackbody?**
 - a) It is theoretical object that absorbs all radiation that strikes it
 - b) It is theoretical object that reflects all radiation that strikes it
 - c) It is theoretical object that diffracts all radiation that strikes it
 - d) None of the above.

7. **What are the electromagnetic waves emitted by a blackbody called?**
- a) Sound radiation
 - b) Seismic radiation
 - c) Blackbody radiation
 - d) Both a and b
8. **How does the temperature of an object affect the electromagnetic radiation it emits?**
- a) It has no effect
 - b) As temperature increases, the power of the radiation increases
 - c) It gets dimmer
 - d) Higher temperatures emit longer wavelengths
9. **Which statement best describes Wien's displacement law?**
- a) A law that states radiation energy decreases with temperature
 - b) Every object emits radiation across a wide spectrum of wavelengths, the peak of that spectrum is a direct result of temperature.
 - c) A law that governs the reflection of light
 - d) A law that describes the absorption of radiation
10. **What is the effect of UV radiation on skin and eye cells?**
- a) It has no effect
 - b) It can cause damaged cells and can lead to cataracts
 - c) It improves skin growth
 - d) It is beneficial and promotes healing