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