Physics - ICS Part 2 Physics Chapter 19 Short Questions Preparation

Q1. What do you understand by work function and stopping potential?

Ans 1: The minimum amount energy required to remove an electron from the surface of a metal is called work function.
And the stopping potential is the potential difference applied to stop the electrons from being ejected from the surface when the light falls on it.

Q2. Define Compton effect.Write formula of Compton shift for scattering angle.

Ans 1: When X-rays are scattered by loosely bound electrons from a graphite target,the phenomena of change in wavelength is known as Compton Effect.Compton shift for scattering angle is given

$$\lambda' - \lambda = \frac{h}{m_e c}(1 - \cos\theta),$$

Q3. What are conclusion made from the pair production?

Ans 1: Pair production is the creation of an elementary particle and its antiparticle,Pair production offers refers specifically to a photon creating an electron positron pair near a nucleus but can more generally refer to any particle antiparticle pair creation.
Energy can be converted into mass according to $E=mc^2$

Q4. What is wave particle duality?

Ans 1: It says that light has dual nature;it travels in the form of waves but interacts with matter in the form of energy particle called as photon.e.g in interference ,reflection and polarization it show the properties of wave nature but in phenomena like pair production and compton's effect light acts as energy particle.

Q5. Is it possible to create a single electron from energy?Explain

Ans 1: No it is not possible to create a single electron from energy.Creation of single electron will be against the law of conservation of charge and the law of conservation of momenteum.In pair production an electron positron pair is produces.

Q6. Differentiate between inertial and non-inertial frame of reference.

Ans 1: A coordinate system in which the law of inertia is valid is called inertial frame of reference.It is non-accelerated frame of reference.

Ans 2: A coordinate system in which the law of inertia is not valid is called non-inertial frame of reference.It is accelerated frame of reference.

Q7. Define pair production and annihilation of matter.

Ans 1: Pair production:The change of very high energy photon into an electron,positron pair is called pair production. Annihilation of matter:When a positron comes close to an electron,they annihilation and produce two photons in the gamma rays range.It is called annihilation of matter.

Q8. As a solid is heated and begins to glow ,why does it first of its absolute.

Ans 1: Since the red light has longest wavelength ,so it will be emitted first and solid appears red first.

Q9. When does light behaves as a wave?When does light behaves as a particle?

Ans 1: Light behave as a wave when it propagates from one place to other and light behave as a particle when it interacts with matter,Light behaves as a wave in interference and diffraction,Light behaves as a particle in photoelectric and Compton effect.

Q10. Distinguished between photoelectric effect and Compton effect.

Ans 1: The emission of electron from a metal surface when exposed to suitable frequency light is called photoelectric effect and when x rays are scattered by loosely bound electrons from graphite target the phenomena of change in wavelength is known as compton effect.
