Photons:

According to Einstein's quantum theory light propagates in the bundles (packets or quanta) of energy, each bundle being called a photon and possessing energy.

(1) Energy of photon : Energy of photon is given by

$$E=h\nu=hc\lambda;$$

where c = Speed of light, h = Plank's constant

$$=6.6\times10^{-34}J-sec,$$

n = Frequency in Hz, λ=Wavelength of light.

(2) Mass of photon : Actually rest mass of the photon is zero. But it's effective mass is given as

$$E=mc^2=h\nu$$

$$\Rightarrow m=Ec^2=h\nu c^2=hc\lambda$$

This mass is also known as kinetic mass of the photon

(3) Momentum of the photon

Momentum

$$p=m\times c=Ec=h\nu c=h\lambda$$

(4) Number of emitted photons : The number of photons emitted per second from a source of monochromatic radiation of wavelength λ and power P is given as

$$(n)=PE=Ph\nu=P\lambda hc$$

; where E = energy of each photon

(5) Intensity of light (I) : Energy crossing per unit area normally per second is called intensity or energy flux

i.e.

$$I=EAt=PA$$

$$(Et=P=radiationpower)$$

At a distance r from a point source of power P intensity is given by

$$I=P4\pi r^2$$

$$\Rightarrow I\propto1r^2$$

(6) Number of photons falling per second (n) : If P is the power of radiation and E is the energy of a photon then

$$n=PE$$