Name Hajira bibi

I'd #15304

3rd Semester

Paper Radiation science and technology.

Q1 / **Write about characteristic Bremsstrahlung and radiation .**

 Ans

Characteristic Bremsstrahlung and radiation

Characteristic x-rays are emitted from heavy elements when their electrons make transitions between the lower atomic energy levels. ... The continuous distribution of x-rays which forms the base for the two sharp peaks at left is called "**bremsstrahlung**" **radiation**

♤**Bremsstrahlung** x-rays are produced when a projectile electron is slowed by the nuclear field of a target nucleus.

♤ electron with kinetic energy of 70kev can lose all ,none ,or any intermediate

Level of that kinetic energy in a bremsstrahlung interaction..

♤in the diagnostic range ,most x-rays are bremsstrahlung x-rays .

♤bremsstrahlung x-rays can be produced at any cathode electron energy. K-characteristic

X-rays require and x Rays tube potential of at least 69 KVP .

Characteristic Radiation.

The electron interaction with an inner shell electron of the target atom

Rather than with an outer shell electron characteristic x-rays

■characteristic x-rays are emitted when an outer -shell electron fills

An inner shell void .

●Characteristic x-rays are produced after ionization of a k- shell .when an

Outer shell electron fills the vacancy in the k shell and x-rays emitted.

■Atomic configuration and electron binding energies for tungsten.

●Only characteristic x-rays tungsten are useful for imaging.

♣this type of x-radiation is called characteristic because it is characteristic of the

Target element .

Question 2# write about the factor that x-rays Quntity

Ans #X-ray photon quantity refers to the number of photons produced during an exposure.

Factors influencing x-ray quantity includes:

- peak voltage (kVp): beam quantity is approximately proportional to the square of the tube potential
- generator type/voltage waveform: reducing ripple increases beam quantity
- beam filtration: increasing filtration reduces beam quantity
- distance from the beam: inverse square law
- current (mA): beam quantity is directly proportional to current
- exposure time (seconds): beam quantity is directly proportional to exposure time
- anode material: beam quantity is directly proportional to the atomic number (Z) of the anode material

Question 3#

list and explain the five factor that effect subject contrast.

Spatial resolution improves with decreased _____ blur	screen, motion, geometric
Higher speed image receptors generally produce images with _____.	increased noise
The slope of the _____ portion of the characteristic curve shows the film contrast.	straight line
In general radiography, the useful optical densities lie between _____ and _____.	0.25, 2.25
The inherent base density plus fog density in film is _____.	0.1-0.3

A film with a characteristic curve showing a high slope would be useful when _____ is needed.	high contrast

Question 4#

define the following terms

(1)collimator.

A collimation is a device which narrow as beam of particle a wave .to narrow

Can mean either to cause the direction of the motion to because more aligned in a

Specific direction.

(2)image contrast

The contrast a property of a display system, defined as the ratio of the luminance of the brightest colour (white) to that of the darkest colour (black) that the system is capable of producing. A high contrast ratio is a desired aspect of any display. It has similarities with dynamic range

(3) Aperture diaphragm.

Aperture is the opaque structure with an opening (aperture)at its

Centre .the role of the diagram as to stop passage of light except for the

Light passing through the aperture.

Question 5# Write a note about Compton scattering and photo electron effect.

Ans#

Compton scattering.

Is scattering of a photon by a charge particle, usually an

Electron. If the result in a decrease in energy of the photon called

Compton scattering.

Photoelectric effect.

■**Photon** interact with an atom and eject one of the orbital electrons

■Entire energy of its absorbed by atom and then transformed

To atomic electron.

■kinetic energy eject electron .

hν=EB

♤vacancy is created in shell .

♤emission of characteristic x-rays.