Q.P. codec-50863

Paper Solution

Sub: Medical Imaging-I, CBSGS

Q.1

A] - True-01, Explanation-03

B] True-01, Explanation-03

C] False-01, Explanation-03

D] True-01, Explanation-03

E] True-01, Explanation-03

Q.2

A] Initial wavelength of X-ray photon

$= 1.24/\text{Energy}$

$= 1.24/200$

$= 0.0062 \text{nm}$

Change in wavelength $= 0.0024(1-\cos\theta)$

$= 0.0024(1-\cos 80)$

$= 0.002 \text{nm}$

But wavelength of scatter photon= Initial wavelength + Change in wavelength

$= 0.0062+0.002$

$= 0.0082 \text{nm}$

Therefore, Energy of scattered photon

$= 1.24/0.0082$

$= 151.21 \text{Kev}$

Energy of Compton electron= Initial energy of X-ray photon- Energy of scattered photon

$= 200-151.21=48.78 \text{Kev}$

B] Explanation of grids and performance parameters – 5marks each

Q.3 $\quad$ (02)

A] Computed Radiography: Diagram-04, Explanation-06

B] Digital Mammography: Block Diagram-04, Explanation-04, Application-02

Q.4

A] List of modes of display-01, Explanation of each type of mode with diagram-03

B] Doppler Shift= $2F_T u \cos\theta / v$

$$= 2*5*10^6*0.2*\cos45/1540$$

$$= 918Hz$$

C] Size of apparent focal spot= Size of actual focal spot*$\sin\theta$

$$= 2mm * \sin17$$

Q.5

A] Electronic real time scanners: Diagram-05, Explanation-05

B] Principle and construction of IITV 5 marks and Vidicon camera is 5 marks each

Q.6

A] Thermography: Working principle-03, Application-02

B] Each application-01

C] Ultrasound Transducer: Diagram-02, Explanation-03

D] Compton Effect: Working principle-03, Application-02

E] ~~Characteristic~~ Radiation: Diagram-01, Explanation-04
$\quad$ General