Mid TERM

**Computed Radiography AND Digital Radiography**

**PAPER**

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**IQRA NATIONAL UNIVERSITY PESHAWAR**

## 

**Question No.1**

**Ans:**

**ADVANTAGES OF DIGITAL RADIOGRAPHY OVER SCREEN FILM RADIOGRAPHY:**

* **The advantages of digital radiography over screen film radiography are following.**

1. Digital radiograph taken less time then screen film radiography.
2. Digital radiography provide high quality image.
3. No darkroom is required for digital radiography.
4. Enhancement of diagnostic image.
5. In digital radiography patient radiation dose will be low.
6. Linear response of image.
7. Digital radiography has much wider dynamic range.
8. Digital radiography have the ability to change and optimize the contrast is of great value.
9. Digital radiography reduce cost and space
10. In digital radiography image can be store in soft form which can be easily transfer through copy, mail etc

**Question No.2**

**Ans:**

**DFFERENCE BETWEEN DIECT DR AND INDIRECT DR**

**Direct DR Indirect DR**

It isone step process**.** It is two step processes**.**

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It convert x-raydirectly intoit convert the x-rays first into light

Electrical charge**.** And then into electrical charge.

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It is made of photo conductor it is made of photodiode materials

Which is directly connected to e.g. CSI

The Flat pannel. Cesu=cesium

E.g. amorphous selenium

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Is used more radiation toless radiation is use to release

Enough electrons**.** Enough electron

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It use more radiations toless radiation is use to release enough

Release enough electron electrons

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No light is involve in direct DR light is involve

Because the releasing electron

Follow the electric field line

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Latent image is more accurate latent image less accurate B/c it is

Degraded by scattering radiation

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**Question No.3**

**Ans:**

**Fill Factor:**

* It is the percentage of pixel area which is sensitive to image signal it may be photon or electron
* The fill factor is portion of the pixel element that is occupied by the sensitive image receptor

**Now why fill factor is important**

* Fill factor is important because it show the **sensitivity area** of the pixel
* It is the percentage of the pixel face that is sensitive to x-rays **80%**
* The pixel face is not totally sensitive to x-ray beam about **20%**
* The fill factor is that is occupied by the sensitive **image rec**eptor
* The fill factor play an important role in **improving spatial resolution** of the image with less patient dose
* When the **size** of the pixel is **reduced** the spatial resolution **increases** but with **high** patient dose
* Smaller the pixel size less the **fill factor** lower fill factor require increase patient dose so it’s a tradeoff
* When the size of pixel is reduced fill factor concentration will be reduced as a result **Kvp** and **mAs** must be increases to maintain proper signal strength while increase in kvp and mAs increase the risk of **high** patient dose
* It is proved the when increase in the fill factor will improve the spatial resolution with **less patient dose**
* Increasing the sensitive of pixel , **less** x-ray beam will be needed to form of high spatial resolution image
* Smaller x-ray beam less will be the patient dose
* Fill factor is **direct relation** with the spatial resolution when fill factor increases the spatial resolution will be increase the quality of image will be better
* It allows the conversion of incident x-ray beam into light
* So that is why fill factor is important**.**

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**Question No.4**

**Ans:**

* The consequences of producing flat pannel digital receptor with small pixel are **noisy image.**
* Noisy image is the is the **fluctuation** **in optical density** on radiograph
* This fluctuation may be cause due to **low radiation dose**.
* Spatial resolution of digital image is limited by pixel size
* Unfortunately while reducing pixel size improves spatial resolution this comes at the expense of signal to noise ratio
* The consequence produce on flat pannel digital image receptor with small pixel as in result will be noisy image
* So the consequence of producing flat pannel receptor with smaller pixel that the resulting image will have increase amount of noise

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**Question No.5**

**Ans:**

**RELEVENT FEATURES OF STORAGE PHOSPHAR IMGE PLATE:**

The features of storage phosphor are following.

* CR use storage phosphor image plate for digital imaging
* When it is stimulated by laser the store energy is set free as a blue photon
* It show resistance to mechanical stress and hence are portable
* It store the absorb energy in crystal defect
* It response to a very wider range of x-rays exposure
* It is reusable and can be used more than 5000 exposure

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