**Course Title: COMPUTED RADIOGRAPHY & DIGITAL RADIOGRAPHY**

**MID TERM ASSIGNMENT**

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**DEGREE: BS.RADIOLOGY (4th SEM)**

**DATE: 26th April, 2020**

1. **Why is fill factor important?**

* **Fill Factor:**
* The percentage of the pixel which are sensitive to x-ray is called Fill Factor.
* **Importance of Fill Factor:**
* The fill factors allows the conversion of the incident x-ray beam into light, the Fill Factor is nearly 80% therefore about 20% x-ray is not taking, where the fill factor is not present.
* With the small pixel the fill factor is also reduced and the ray intensity must be increased to maintain the adequate signal strength.

1. **What are the consequences of producing ﬂat panel digital image receptors with smaller pixels?**

* The consequences of producing flat panel digital image receptor with small pixel are noisy image.
* Noisy image is the fluctuation in the optical density of the radiograph and this fluctuation may be caused due to low radiation dose. From here we know that the consequences producing flat panel digital image receptor with small pixel will result in noisy image. And the resulting image will have increased amount of noise.

1. **Differentiate between direct digital radiography and indirect digital radiography.**

* **Direct Digital Radiography:**
* In DR the x-rays are converted to electric signals.
* No scintillation phosphor is involved.
* The captured element of direct DR is amorphous Selenium.
* Having good spatial resolution.
* **Indirect Digital Radiography:**
* Cesium iodide is a charge couple device for the Indirect DR.
* X-ray are first converted into light and then into electric signals.
* The capturing element is cesium iodide.
* The coupler element is Fiber Optic.
* The collector element is CCD/CMOS.
* CCD converts the light into electric signals and image display on monitor.
* Having good spatial resolution.

1. **Discuss the relevant features of a storage phosphor imaging plate.**

* **Storage Phosphor Imaging Plate (SPIP):**
* Computed radiography uses storage phosphor imaging plate for digital imaging.
* Storage Phosphor Screen incorporate Phosphors growth as linear filaments that increase the absorption of x-rays and limit the spread of stimulation emission.
* Imaging Plate has shorter exposure time or smallest amount of dose rate required.
* Imaging plate system is one of the best x-ray area detector because of high Detective Quantum Efficiency (DQE).
* Autoradiography also using storage phosphors technology.
* The PSP screen is not loaded and unloaded in dark room, but it’s handled in daylight.
* IP improves the contrast resolution of the image receptor.

1. **Describe ten advantages of digital radiography over screen-film radiography.**

* **Advantages of Digital Radiography over Screen Film Radiography:**

1. DR makes storage of large amount of images in smaller time and quick access which in screen film is subjected to loss through storage.
2. DR increase dynamic range.
3. DR leads to a higher patient thorough-put.
4. Linear response of images.
5. Easy to achieved since image are in digital format.
6. DR has availability of post-processing functions (crop etc.).
7. Separation of image capture, processing, storage and display processing which means they can optimize individually.
8. DR reduce radiation dose.
9. DR has superior image Quality.
10. DR having no wet processing.