

**RAD 341 Image recording**

**First midterm exam**

**23-10- 2013**

**Student Name:**

**Student ID:**

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| --- | --- | --- | --- |
| Section | A | B | C |
| Marks | 10 | 10 | 10 |

**Section A: Fill in the following blanks: ( /10 marks)**

1-The components of an x-ray tube include:

1. ........................................2)......................................

3)........................................4)........................................

5)...........................

2- Radiographs should be correctly identified with sufficient pt details on it, this should include: 1-...................................................... 2-.............................................................

3-The emulsion layer consists of.....................................................

4-The difference between Fluorescence and Phosphorescence is.....................

5-The function of the cassette is 1-.............................................................

2-...............................................................3-....................................................

6-In the past Phosphor layers were made of……………………….., nowadays, they are made of rare earth elements such as………………… and …………………..

7- Arrange the tissues according to their grayscale appearance in x-ray (lighter to darker): (Fat – bone - air- metal - muscle)

8- Draw a simple sketch of a cross section in an intensifying screen, aiding your sketch with labels. **( /2 marks)**

**B: State if the following sentences are “True” or “False” and CORRECT THE FALSE SENTENCES. ( /10 marks)**

|  |  |
| --- | --- |
| **1-**In radiography, the radiation beam is reflected from the pt to the film that is located behind the x-ray tube. |  |
| **2-**The stationary x-ray tube produces higher output than the rotating x-ray tube**.** |  |
| **3-**Modern x-ray tubes have a graphite back coating on the disc to increase heat dissipation. |  |
| **4-** One property of x-rays is that they can be deflected by electric or magnetic fields. |  |
| **5-**Screen films are faster than direct non-screen films but less resolution. |  |
| **6-** X-ray films should be kept in cool ,dry and dark placeand should be stored vertically to avoid any harmful effect caused by pressure |  |
| **7-**The function of the intensifying screen is to absorb x-ray photons and convert them into light |  |
| **8**-When x-rays penetrate the patient`s body they are attenuated by the organs in the body, meaning they emerge equally with the same intensity. |  |
| **9-** Intensifyingscreens should be cleaned regularly and should be left open on the bench when not in use. |  |
| **10-**Rare earth materials have higher QDE and capture efficiency than calcium tungstate. |  |

**Section C: Choose the most correct answer from the following: ( /10)**

1. **In radiography, the image on the film depends on:**
2. How much radiation passes through the object and reaches to the film.
3. How much radiation is reflected back to the x-ray machine.
4. How much radiation is scattered from the pt.
5. All of the above.
6. a & b only

**2) The purpose of the rotating anode is:**

1. Reduce the amount of current needed to operate the x-ray tube.
2. To produce a higher tube potential difference.
3. To spread the heat produced during the exposure.
4. To create a vacuum in the x-ray tube.
5. b & d

**3) In a rotating anode x-ray tube, the anode disc is made of:**

1. 10% tungsten and 90% rhenium.
2. 90% tungsten and 10% rhenium.
3. 90% rhenium and 10% tungsten.
4. 90% tungsten and 10% molybdenum.
5. None of the above

**4) The function of the film base is:**

1. Binds the emulsion layer to the film.
2. Serves to protect the emulsion from mechanical damage.
3. Prevent light from damaging the film.
4. Convert photons to light.
5. Provides structural support to the emulsion layer.

**5) The** **Fast speed screens consist of:**

1. Thin layer and relatively small phosphor crystals.
2. Thick layer and relatively large phosphor crystals.
3. Thick layer and relatively small phosphor crystals.
4. Thin layer and relatively large phosphor crystals
5. None of the above.

**6) The advantage of using intensifying screens:**

1. Reduce pt dose, shorter exposure times and less contrast.
2. Higher contrast, higher pt dose and less exposure time.
3. Increase pt dose, longer exposure time and less contrast.
4. Higher contrast, less pt dose and less exposure time.
5. Reduce pt dose, higher contrast but more exposure time.

**7) The function of the fixing agent is:**

1. Converts the silver ions of exposed silver halide crystals to metallic silver.
2. Removes the unwanted light photons from the film.
3. Dissolves unexposed silver halide crystals, leaving only atomic silver.
4. Exposes the silver halide crystals.
5. None of the above.

**8) The** **Differences between metallic silver and silver halides is:**

1. Metallic silver unaffected with fixation agents and remain insoluble.
2. Metallic silver is sensitive to light.
3. Metallic silver is not sensitive to light, Opaque to light.
4. Metallic silver can be dissolved using fixing agent.
5. a & c
6. b& d

**9) Characteristic x-rays occur when:**

1. An outer electron gets ejected from its orbit and an inner electron fills the vacancy.
2. An innerelectron gets ejected from its orbit and an outer electron fills the vacancy.
3. The x-ray photon is deviated from its original path by the field of the nucleus**.**
4. An outer electron is ejected from the atom and its vacancy is not filled.
5. None of the above.

**10) Slow speed screens are:**

1. Used when the risk of movement is high for pediatric & abdomen imaging
2. Need higher doses of ionizing radiation.
3. Used when fine detail is required mainly for extremity.
4. a & b
5. b &c