**King Saud University**

**Collage of Applied Medical Science**

**Department of Radiology Science**

**RAD 323**

**First Midterm Exam 2014/1435**

**CT Physics and Instrumentation**

Please answer all questions (You have 3 questions)

Exam duration: 1 hour

Please write your name and student number in each page (you have 4 pages including coversheet)

Student name: ……………………………………………………………………………………………………

ID number: ………………………………………………………………………………………………………..

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| --- | --- | --- | --- | --- |
| **Questions** | **A** | **B** | **C (C1 or C2)** | **Total** |
| **Marking** | Out of 9 | Out of 7 | Out of 4 | Out of 20 |
| **Score** |  |  |  |  |

**11/ 3/2014**

**Question [A]**

**Multiple choice questions MCQs. Choose the most appropriate answer; only one.**

**(10 marks)**

1- In X-ray production, total number of electrons converted to heat is 99% and only 1% of the electrons are converted to x-rays

1. True
2. False

2- The limitations of radiography over computed tomography are:

1. Superimposition of structures
2. Quantitative rather than qualitative
3. Limited contrast resolution
4. a and c only

3- The purpose of the filters inside the gantry of computed tomography is to:

1. Remove unnecessary long wavelength x-rays that add to patient dose
2. Produce a uniformity beam by shaping the energy distribution
3. All of the above
4. None of the above

4- Which of the following is NOT an operator-dependant computed tomography parameters:

1. The number of flowing electrons
2. Reconstruction algorithm
3. Slice thickness
4. None of the above

5- Increasing the current (mA) will lead to:

a. An increase in the intensity with a decrease in the energy

b. A decrease in the intensity with a decrease in the noise

c. No change in the energy with an increase of the photon number

d. Sharper image with an over exposure

6- Computed tomography and radiography are acquire images in the frequency domain

1. True
2. False

7- If the FOV is constant, the larger the matrix size:

a. The larger pixel size with better resolution

b. The smaller pixel size with low resolution

c. More number of pixels with better resolution

d. None of the above

8- Image enhancement in computed tomography is used to:

1. Enhance the shape and the edge for better image quality
2. Reduce the noise
3. All of the above
4. None of the above

9- Which one is represent a continuous distribution of light intensity as a function of position:

1. Digital images
2. Analog images

**Good luck**

**Alhanouf Alshedi**